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Volume 24 JANUARY 1955 Number 1

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REFERENCES

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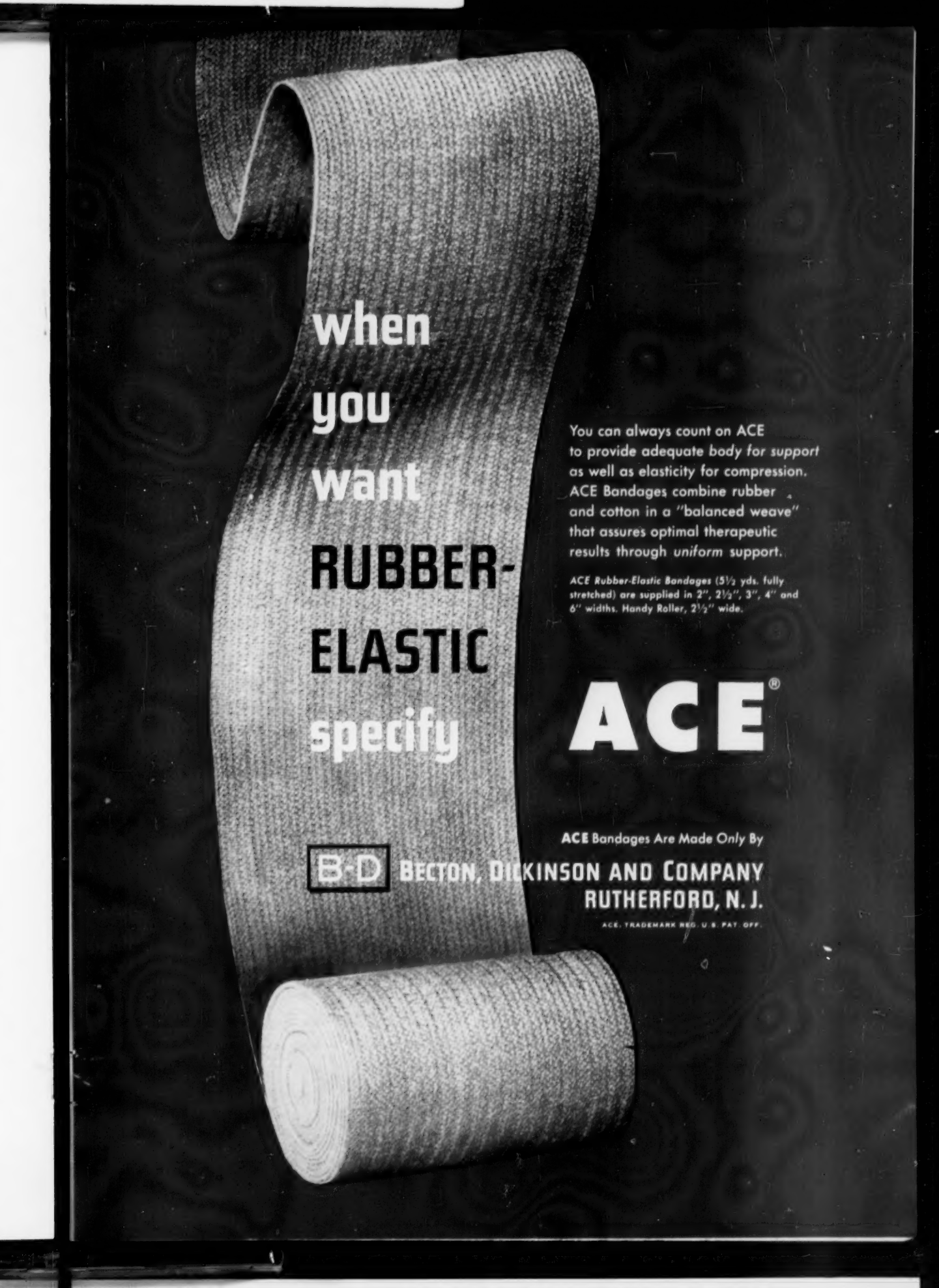
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This Journal is dedicated to the advancement of sound industrial medicine, including the surgery of industrial trauma. To that end its varying contents will embrace scientific papers, reports, digests, news items and official statements, together with editorial comment. The editorial policy is to avoid undue censorship. Some contributions ably prepared will be published although contravening the personal opinions of the editors. Care will be exercised in checking the accuracy of known facts, as printed, but in all other respects statements and opinions are those of the author and may not be shared by the editors. On any article, the editors reserve the right to comment favorably or otherwise, in the current or any subsequent issue. On this basis, contributions are invited. The opinions expressed in any contributions, including the editorials of this Journal, do not necessarily reflect the attitude or opinions of any associated organization.

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cally Handicapped for his work in helping the handicapped obtain U.S. government jobs. DR. HARVEY is assisting in drawing up plans for a voluntary health insurance program for Federal employees. In the war years 1942-45, 69,842 disabled were placed in government jobs. Since 1945, when placements were more difficult than in wartime, jobs have been found in government for 82,750, according to Commission estimates.

ALFRED H. WHITTAKER, M.D., Detroit, is the author of an original article, "The Beaumont Memorial on Mackinac Island," published in the *Bulletin of the History of Medicine*, July-August, 1954, based on his manuscript read at the 27th Annual Meeting of the American Association of the History of Medicine, New Haven, Connecticut, May 7, 1954.

NOEL GATES MONROE, M.D., will retire on February 28, 1955, as Medical Director of the Boston Edison Company, which position he has held since 1925. Graduated from Harvard in 1919, DR. MONROE was affiliated with the American Optical Company from 1919 to 1925. He has been a Fellow of the Industrial Medical Association since August 25, 1942.

FRANK L. RECTOR, M.D., long identified with the work of the American Cancer Society, has retired, and will live in Portland, Oregon. DR. RECTOR was born in Iowa, in 1879. He graduated M.D. at George Washington University School of Medicine, Washington, D.C., in 1907. He was engaged in bacteriological research, Department of Agriculture, 1903-08; in sanitary bacteriological research, New York, 1909-18; in industrial medical research, Public Health Service, 1918-20; and, with the National Industrial Conference Board, New York, in industrial medical research, 1920-25. He was Editor, *The Nation's Health* in 1925-27; made a survey of health and medical work in state and county prisons in 1928; was Executive Secretary, Chicago Medical Society, 1929. For many years he was Secretary of the Conference Board of Physicians in Industry, and of the New England Conference of Industrial Physicians. He is an Honorary Member of the Industrial Medical Association.

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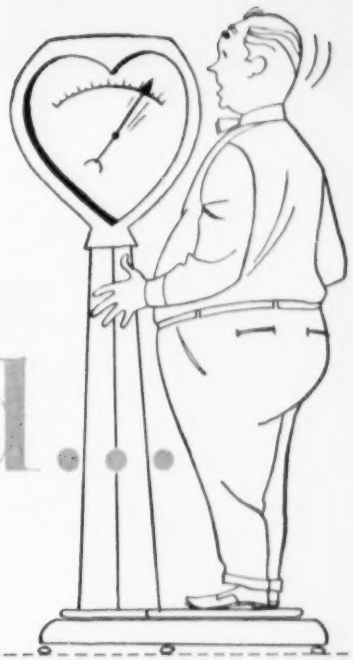

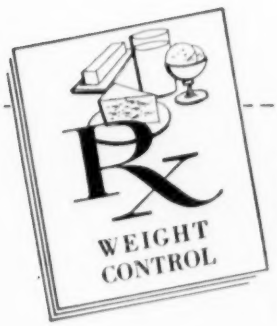

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JAMES T. CASE, M.D., of Chicago, Illinois, and Santa Barbara, California, formerly of Battle Creek, Michigan, President of the American College of Radiology, will preside at the Fifth Inter-American Congress to be held in Washington, D.C., April 24-29, 1955.

TERRY E. LILLY, M.D., President of the Kansas City Industrial Medical Association, writes that the meeting of that Association, December 7, was attended by 30 members and guests. E. H. CARLETON, M.D., and R. EMMET KELLY, M.D., were guest speakers.

INDUSTRIAL HYGIENE FOUNDATION'S Medical Committee now has O. A. SANDER, M.D., Chairman; A. G. KAMMER, M.D., Co-Chairman; D. C. BRAUN, M.D., Secretary; and members: E. H. CARLETON, M.D.; L. E. HAMLIN, M.D.; R. A. KEHOE, M.D.; E. M. KLINE, M.D.; C. HOWARD MARCY, M.D.; L. C. MCGEE, M.D.; C. M. PETERSON, M.D.; C. D. SELBY, M.D.; W. P. SHEPARD, M.D.; J. F. SHRONTS, M.D.

WILLIAM A. SAWYER, M.D., of Rochester, New York, spoke before the First Interstate Scientific Assembly of the Medical Societies of the District of Columbia and the State of Virginia in Washington, D. C., on November 1, on the subject of "Union Welfare Funds and the Doctors." DR. SAWYER, formerly Medical Director of Eastman Kodak Company, and Past-President of the Industrial Medical Association, is Chairman of the A.M.A. Committee for Medical Care of Industrial Workers, and Medical Consultant to the International Association of Machinists. In his speech, which is to be published in *Medical Annals of the District*

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of Columbia, he stressed the need for rapprochement between organized medicine and organized labor. DR. SAWYER also spoke in Asbury Park, New Jersey, November 13 before the Group for the Advancement of Psychiatry, on the therapeutic goals of psychiatry in industry from a Medical Director's point of view. And on November 17, he spoke on the "Relation of Workmen's Compensation and the Disability Benefits Law to Problems of Rehabilitation: Labor Viewpoint," at the Institute on Rehabilitation in Industry, in Buffalo at a meeting sponsored by the University of Buffalo School of Medicine, the Erie County Medical Society, the Niagara Frontier Section of the Industrial Medical Association, and the Buffalo Academy of Medicine.

ADDRESSING 25 industrial physicians assembled at the Lever Brothers plant, DR. G. ALBIN LIVA, Medical Director of the Bergen County Civilian Defense and Disaster Control, stated that cooperation of members of the Industrial Physicians Group, sponsored by the Industrial Council of the Bergen County Y.M.C.A., is needed to provide adequate medical coverage in time of disaster. Physicians at the gathering were members of the Industrial Physicians Group. DR. W. F. FITZHUGH, of Ridgefield Park, Chairman of the meeting, introduced EVERETT HARDING, Secretary for the Industrial Council, and DR. JOHN J. POUTAS, National Medical Director for Lever Brothers.

—*Hackensack, New Jersey, Bergen Record*, November 24, 1954.

A SERIES of lecture-discussions is being offered at the Bridgeport Hospital at 8:30 P.M. on Friday evenings by the Section of Occupational Health, Department of Public Health, Yale University School of Medicine, New Haven, and the Committee on Industrial Health, Connecticut State Medical Society, at the request of the Bridgeport section of the Fairfield County Chapter, American Academy of General Practice. The meetings, open to all interested physicians, began November 12 with a session on back injuries. The course (16 hours of postgraduate training) includes: December 3, Workmen's Compensation; January 7, 1955, Non-occupational Illness—Cardiac, Diabetic, Tuberculosis; January 28, Psychiatric Problems in Workers; February 11, Occupational Diseases; February 25, Administration of Health Programs; March 11, Insurance Programs, Certification of Illness; March 25, Occupational Skin Disease, Diagnosis.

MICHIGAN State Medical Society and University of Michigan announce a Conference for Physicians, on "Gerontology—Medicine's Responsibility to Older People," January 13-15, 1955, at Rackham Building, Ann Arbor. The University will be represented by the Institute of Industrial Health, the Medical School, the School of Public Health, and the Division of Gerontology. S. C. WIERSMA, M.D., and O. T. MALLERY, JR., M.D., are Co-Chairmen of the Planning Committee. The announcement says "a publication will grow out of the manuscripts presented at this Conference." There will be about a score of

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presentations—among them being one on "Industrial Medicine: Retirement," by CHARLES E. DUTCHESS, M.D.

LONG ISLAND Industrial Nurses Association is sponsoring an educational program for nurses in industry at Adelphi College, Garden City, New York, starting Tuesday, February 15, 1955, 8:00-10:00 P.M., and continuing for six consecutive Tuesdays with the exception of February 22. The lecture program: (February 15) "Organization and Physical Setup of a Medical Department"—HARRY TEBROCK, M.D., Medical Director, Sylvania Electric Company; JOYCE BENOIT, R.N., Industrial Nurse, Sylvania Electric Company. (March 1) "Programs of a Medical Department"—IRVING R. TABERSHAW, M.D., Medical Director, New York State Department of Labor. (March 8) "Industrial Nurses Working Relationship"—ROBERT P. JESSUP, M.D., Medical Director, Sperry Gyroscope. (March 15) "Medical and Surgical Emergencies in Industry"—JOSEPH C. LANE, M.D., Medical Examiner, Long Island Lighting Company. (March 22) "Compensation and Legal Aspects of

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Industrial Nursing"—JERMYN MCCANN, M.D., ARTHUR ALTENDERFER, Liberty Mutual Insurance Company. (March 29) "Current Trends in Medicine and Surgery"—DAVID GOLDSTEIN, M.D., Associate Professor of Industrial Medicine, New York University.

Occupational Chest Diseases

A CONFERENCE on silicosis and occupational chest diseases will be jointly sponsored by the McIntyre Research Foundation of Toronto, Canada, and the Saranac Laboratory of Saranac Lake, February 7 to 9, 1955, in the Town Hall at Saranac Lake. The papers to be presented in the five full sessions will report on original work conducted or sponsored by either the Foundation or the Laboratory, which have been conducting research along parallel lines. In addition, papers will be presented by guest lecturers. DR. ANTHONY J. LANZA, formerly Director of the Institute on Industrial Medicine and now Emeritus Professor of Industrial Medicine at New York University-Bellevue Medical Center, has been named Chairman of the conference and also of the scientific program committee. Communications on the conference should be addressed to MR. NORMAN R. STURGIS, JR., Saranac Laboratory, Saranac Lake.

New York Institute Courses

INSTITUTE of Industrial Medicine, New York University, Postgraduate Medical School, is offering two courses dealing with the basic problems encountered in the control of environmental hazards. These are planned to be of particular interest to industrial hygienists, industrial physicians, safety engineers, insurance representatives, and others in the field of occupational health and safety. The courses are given in cooperation with the New York University College of Engineering, and will be held at the Engineering School during the Spring Semester (February 7-May 27, 1955). The Industrial Hygiene course (Mondays, 7:00-9:00 P.M.) will include lectures and laboratory demonstrations on the engineering control of occupational diseases; factors affecting the health of industrial workers; evaluation and control of exposure to dusts, fumes, mists, vapors, gases, radiations, noise, abnormal temperatures, etc.; practical examples of occupational disease control methods; ventilation, air conditions, and local exhaust systems; relationship to safety engineering, sanitary engineering and other public health factors involved in the control of environmental health in industrial plants. The Industrial Hygiene Laboratory course (Wednesdays, 7:00-10:00 P.M.) will be devoted to industrial hygiene laboratory methods employed in detection of atmospheric contamination; measurement of air flow, illumination, noise, and radiation; determination of dusts, gases, solvents in air, etc. The Institute is also offering a course on Air Pollution, February 10-May 26 (Thursdays, 4:00-6:00 P.M.). And beginning on Monday, January 10, and continuing through Friday, January 21, in cooperation with the United States Atomic Energy Commission, it offers a course on "Introduction to Radiological Safety." Details on all of these courses may be obtained from the Dean, College of Engineering, New York University, University Heights, Bronx 53, New York.

At a Conference on Undergraduate Training in Occupational Medicine at the University of Oklahoma School of Medicine, November 9 and 10, 1954, representatives of 11 Medical Schools were present. The participants (left to right): Jean S. Felton, M.D. (University of Oklahoma); Sophie Rabinoff, M.D. (New York Medical College); Robert B. O'Connor, M.D. (Harvard University); Henrietta Herbolsheimer, M.D. (University of Chicago); Lemuel C. McGee, M.D. (University of Pennsylvania); Robert F. Bell, M.D. (University of Colorado); Fred A. Bryan, M.D. (University of California at Los Angeles); Alvin F. Meyer, Lt. Col. U.S.A.F., M.S.C. (Creighton University); D. John Lauer, M.D. (University of Pittsburgh); Miss Glorine Sharp, Secretary to Dr. Felton; and Otto Tod Mallery, Jr., M.D. (University of Michigan). Absent from the picture was Gradie R. Rowntree, M.D., (University of Louisville). The report of the Conference will appear at a future date.

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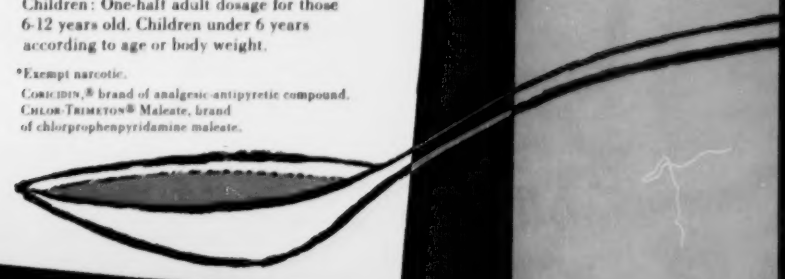

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1. Neo-Cortef* *ointment (topical)*

Each gram contains:

Hydrocortisone acetate ..... 5 mg. (0.5%) or 10 mg. (1%) or 25 mg. (2.5%)
Neomycin sulfate ..... 5 mg.**
Methylparaben ..... 0.2 mg.
Butyl-p-hydroxybenzoate ..... 1.8 mg.

Supplied:
5 Gm. and 20 Gm. tubes in plastic cases

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Each gram contains:

Hydrocortisone acetate .. 15 mg. (1.5%)
Neomycin sulfate ..... 5 mg.**

Supplied: 1 drachm applicator tubes

3. Neo-Cortef* *drops (eye and ear)*

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Neomycin sulfate ..... 5 mg.**

Supplied: 5 cc. dropper bottles

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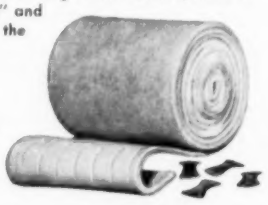

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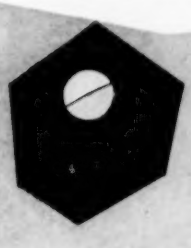

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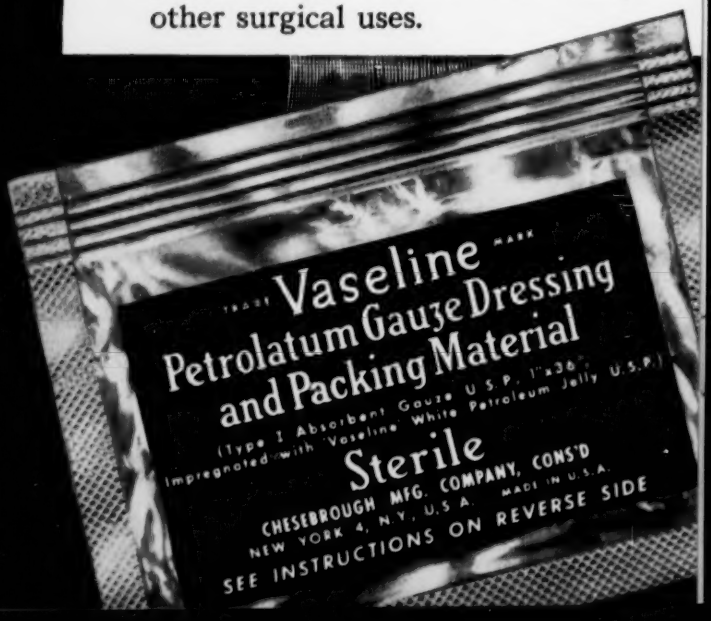
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due to back injuries reduced from 35.7% to 0.1%, with Mephate®

A recently published clinical study* of back injuries among 17,000 manufacturing workers, disclosed that "one of the biggest problems facing the industrial physician is the care of the traumatized lower back"... and showed how this problem was solved by one firm:

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"... the percentage of lost time due to back injuries... dropped from a high of 35.7% to a low of 0.1%."

* Jessup, R., Murray, R. J. and Rossi A.: Am. Pract. & Dig. Treat. 5:792, 1954.

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Of course, the estimated 3 out of every 5 patients here in the U. S. suffering from such conditions represent a continuing, and sometimes exasperating, problem.

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upper respiratory tract involvements
. . . infectious and allergic
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Administration: *Adults*—Two or three sprays in each nostril, 4 or 5 times a day as needed, or as directed by physician.

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*(Response in 254 of 302 patients[1-5])

1. Busis, S. N., and Friedman, L. L.: Antibiotics & Chemotherapy 3:299, 1953. 2. Lazar, A. M., and Goldin, M.: Eye, Ear, Nose & Throat Monthly 32:512, 1953. 3. Cohen, B. M., and Mendelsohn, R.: Laryngoscope 63:1118, 1953. 4. Wittich, F. W.: Ann. Allergy 12:185, 1954. 5. Vickers, M. A.: Laryngoscope 64:632, 1954.

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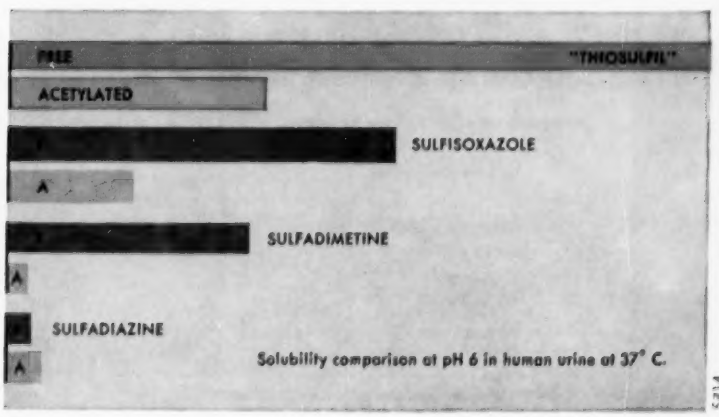

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Soreness and stiffness of muscles . . .
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combines the stimulating and metabolic effects of iodine in Iodex and the analgesic action of methyl salicylate.

Absorption through the skin may be aided by massage, heat or iontophoresis.

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Lost time is lost money

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Saving time is but one of the advantages of Furacin in industrial practice

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Contain Furacin 0.2% in water-miscible vehicles

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Supply: vial of 14 Gm. (½ oz.).
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Supply: 2 oz. tube; 4 oz., 1 lb. and 5 lb. jars.
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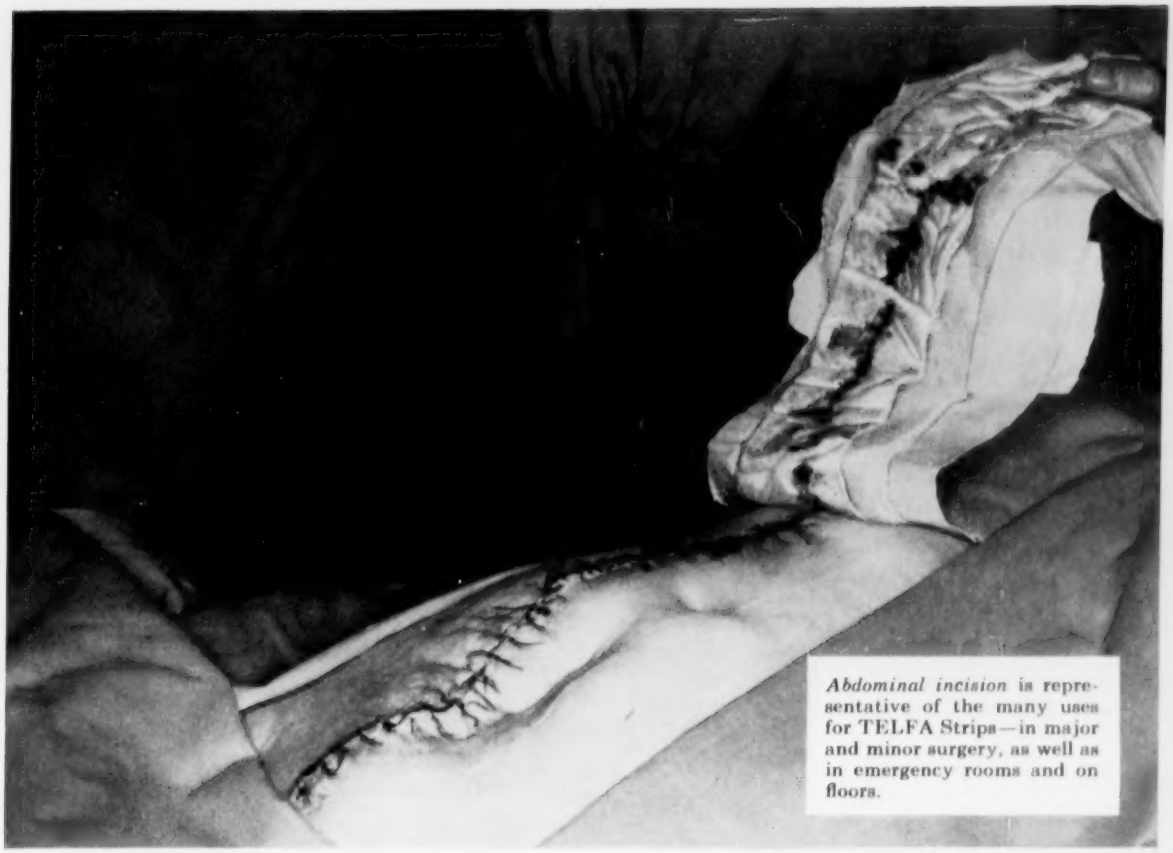

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NEW TELFA *DRESSING* keeps wounds dry without sticking!

Promotes better healing of all wounds—by primary intention

This new all-purpose dressing is both fully absorbent and completely non-adherent. TELFA Strips keep wounds dry, yet can be changed easily, painlessly, and without disruption of the healing wound surface.

TELFA is a non-wettable, perforated plastic film bonded to *Webril*®, a highly absorbent backing of 100% pure cotton.

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Supplied in 2½″ x 4″ and 3″ x 8″ Strips, in hospital cases; and in 2″ x 3″ sterilized envelopes for doctors' offices.

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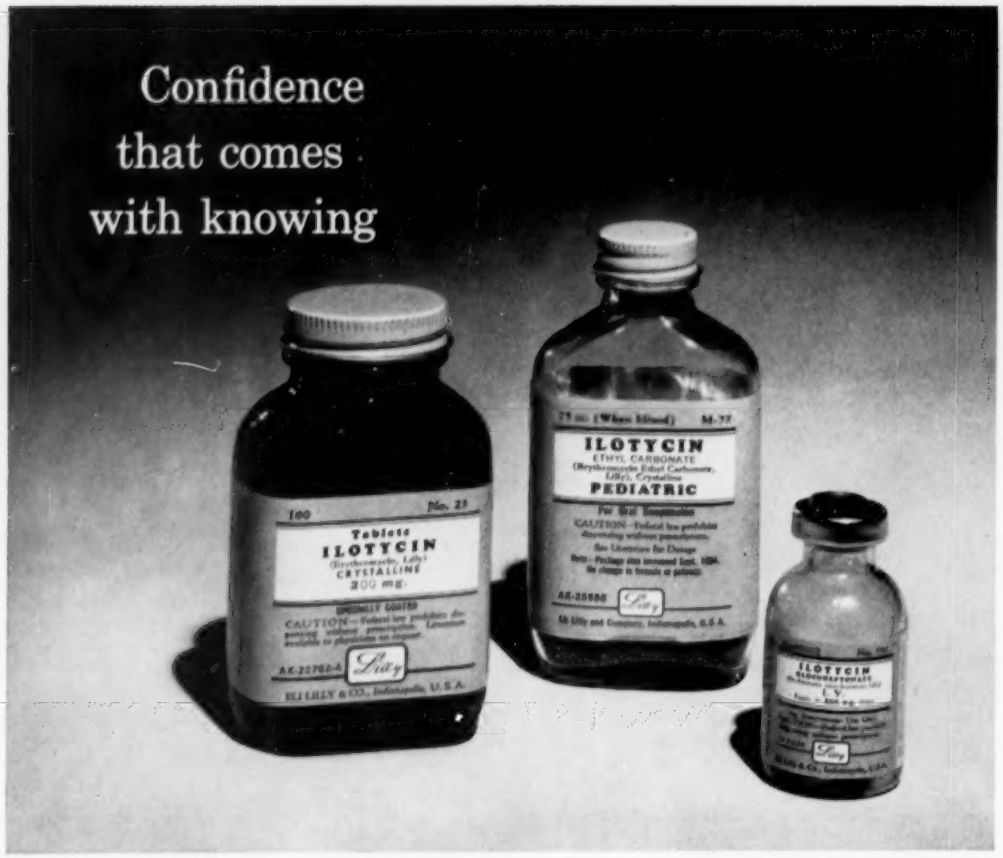

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(ERYTHROMYCIN, LILLY)

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INDUSTRIAL MEDICINE AND SURGERY
JANUARY, 1955

Manganese Poisoning

THE 1954 RAMAZZINI ORATION

RAFAEL PEÑALVER, M.D., Habana, Cuba

ON THIS OCCASION by your invitation a physician from a sister country is given the opportunity to present the Ninth Annual Ramazzini Oration. If it be true that this is the first time a physician other than a member of your own group is so recognized, then indeed I must respond to this distinguishment. In fulfilling my obligation it is my purpose, with your good will, to portray manganese poisoning as seen by us in Cuba. However, in providing balance for this paper, many excerpts are used from and many references are made to the work of others in many countries.

Sources and Uses of Manganese

THE PRINCIPAL uses of manganese are in the manufacture of alloy and steel, dry cells, and chemicals. All steel alloys contain manganese. Hundreds of thousands of tons of manganese are required each year by steel and other metal making industries. For each ton of steel, 14 kilograms of manganese are required. Most of the manganese is found in Russia, India, South Africa, the Gold Coast, Brazil, and Cuba.* Until a few months ago, the average production of the most important mine in Cuba was 30,000 tons monthly. The mineral is transported to the port of Santiago de Cuba, whence it is exported to the United States.

Analysis of Cuban manganese ore shows: metallic manganese, 44.79%; metallic iron, 1.21%; proportion Mn/Fe, 36.98 to 1%; water, 12%.

The ore known to be found in the United States is a low-grade ore and has had no commercial value until recently. A new process to obtain from low-grade ores, high-grade battery-active manganese dioxide is the proud achievement of Western Electro Chemical Company.

History

MANGANESE poisoning was described in medical literature for the first time in the year 1837, by Cooper of Scotland. Outstanding scientific men have contributed to the better knowledge of manganese poisoning, such as Baader in Germany; Biduault and Lemos in France; Dantin Gallego in Spain; Cranch, McNally, Edsall and Wilbur in the United States.

During the last few years some articles have been published with extensive bibliographies and personal experiences of the authors. Among them: (1) "Chronic Manganese Poisoning in an Ore-Crushing Mill." Flinn, Neal, and Associates. Federal Security Agency, Washington, D.C., 1940. (2) "La Intoxicacion por Manganeso en Chile." Ansola Jimenez, Uiberal y Escudero. *Prensa Medica Argentina*, 1946. (3) "Le Manganism dans les Mines Maroccaines." Rodier. *Bulletin d'Linstitut D'Hygiene Du Maroc*, 1949.

In Cuba it was Manuel Garcia Avila, President of the Cuban Industrial Medical Association, who in the year 1952 reported the first clinical diagnosis of manganese poisoning in our country, through the initial publication, "Intoxicacion Professional por Manganeso, Informacion Preliminar." *Medicina del Trabajo*, 1953. This was followed by, "Manganese Poisoning in the Mines of Cuba." Garcia Avila y Peñalver. *Industrial Medicine and Surgery*, May, 1953. *Medicina del Deporte y del Trabajo, Argentina*, Octobre, 1953.

Garcia Avila devoted all his efforts to the study of this intoxication. He organized the symposiums of the summer session of the University of Habana, and of the Cuban Industrial Medical Association, held a few weeks prior to his death.

Routes of Entrance

THE MOST important route of entrance is the respiratory to such an extent that some authors believe it is the only one to consider. It is believed that the amount of manganese absorbed by ingestion is insignificant. If there is no solution of continuity, the metal does not pass through the skin. Based on the appearance of a miner, after leaving the tunnel, entirely covered with dust, it could be assumed that the cutaneous route has some significance, but it has been demonstrated that it has none.

Absorption

AFTER it reaches the blood stream, manganese has a predilection for certain nerve cells at the base of the brain and upper portion of the spinal cord. To some extent it affects the supply

*The mapping out of a deposit of at least 150 million tons of manganese ore in Canada's province of New Brunswick near the eastern border of Maine was announced in *Newsweek* for December 27, 1954.

to all voluntary muscles. This causes a definite "slowing down," as described by Cranch, of all voluntary muscle control.

In animal experimentation, by means of histochemical analysis, the selective action of manganese on the nerve cells and the liver has been shown. Hugo Mella gave intraperitoneal injections of Cl_2Mn to four monkeys, observing histopathological changes in the pallidum and striatum as well as in the liver. Lemos exposed guinea pigs and found a high concentration of manganese in the spinal cord, kidneys and testes. Cranch does not give any importance to these investigations since the manganese compounds which were administered were not those which are used in industry. He affirms that if such vital organs were affected the victims would not live so many years as "healthy invalids."

The fact that the elimination of manganese is maintained after prolonged absence from exposure makes one think that there are deposits in the body. Chemical analyses which have been made have shown high manganese concentrations in the following order: lungs, kidneys, liver, intestine, heart, bones, brain, stomach.

In Cuba, in 1948, in a necropsy of a welder by Diaz Padron and Garcia Romeu, the presence of a high concentration of manganese in kidneys was found according to spectrographic tests.

Elimination

ALMOST all the investigators agree in stating that most of the excretion is by the feces, through the bile. Rodier believes there is no elimination by the urine. Ceresa, of Italy, uses as an index of the therapeutic value of Dimercaprol the manganese eliminated by the urine.

The results obtained by spectrographic tests performed by Garcia Romeu in nine Cuban patients suffering manganism, with neurological manifestations, are as follows (Table I):

TABLE I.

METODO: ESPECTROGRAFICO DE EMISION.
INSTRUMENTO: ESPECTROGRAFO DE 1.5 METROS DE GRATING.
PELICULA: 103-F "KODAK." TIEMPO: 15 SEGUNDOS.
LECTURA: DENSITOMETRO-COMPARADOR ARL.
EQUIPO: REVELADOR A 75° F.

Micrograms of Mn por 100 cc.	Blood	Urine	Feces (100 grams)
A.C.	17.0	0.0	177.0
S.L.	47.0	11.0	286.0
M.P.	7.0	0.0	177.0
M.C.	12.0	0.0	145.0
R.C.	21.0	0.0	210.0
L.F.	22.0	10.0	102.0
S.O.	1.0	0.0	37.0
V.M.	11.0	0.0	0.0
G.C.	1.0	0.0	40.0

Length of Exposure

THE LENGTH of exposure is in relation to such factors as copiousness of the mineral, degree of oxidation, individual sensitivity, specific work of the employee, personal hygiene, etc.

This period of time is also related to the number of hours of daily work, number of days worked during the week, vacations, etc.

Authors from Chile point out as the shortest exposure a case of only 49 days and the longest a period of 480 days, with an average of 178 days. Uiberall observed, during three years, 432 workers, and the incidence of poisoning was 14.8% (64 cases). Rodier mentions as length of exposure between six months and two years.

We must recognize a mistake in our own observations, with reference to length of exposure. The first cases found it was more convenient to their rights if they referred to the beginning of the disease after the new insurance company assumed the risk.

Individual Sensitivity

IT IS possible that in no other occupational disease is individual sensitivity more important than in manganism. In this intoxication, while some workers are exposed for many years with no trouble as if they were immune, some others are quickly intoxicated. Many facts are to be considered, such as avitaminosis; liver dysfunctions; drug addictions; chronic infections such as syphilis and malaria; pulmonary infections such as tuberculosis and pneumonia; condition of the lymphatic system; and permeability of the upper respiratory tract.

Without being able to argue with statistics, these observations, because our studies were recent, call attention to an element which we have not earlier considered—the race. We observed a high percentage of Spaniards working many years as if they were immune. We also propose to make a comparative study of sensitivity between the white and black races. I think that predisposing factors involving the nervous system, such as syphilis, vital diseases, and alcoholism, should be well studied. We also have noticed that several times the victims were brothers; while in big families, working as drillers, no members were intoxicated. All authors agree that sensitivity is not related to age. If any means to determine the susceptibility could be found, it would be important for prophylaxis. One author said: "There is no way to determine susceptibility, however it does exist."

Working Conditions

RIGHT now we are only referring to the number of hours of work and to an element widely considered, the pneumatic drill. A certain number of perforations can be made in four or five hours and this is considered a work day. Frequently the miners work "extra time" which means they remain eight or 10 hours in the tunnel, which in one way or another provokes the intoxication.

Many times we have heard that only those who work with the pneumatic drill get sick because of the vibration it produces. If this were true, there would be many patients wherever the pneumatic drill is used. It has been considered that in other mines where they don't use the pneumatic drill there are no cases of intoxication. However, it is not the cause, but the result; it is not the drill, but the manganese particles which cause the manganism.

Fig. 1.
Persistent unmotivated laughter characterized numerous patients.

Onset of Manganism

THE FIRST manifestations of the intoxication are usually of subjective character, so it is important to be able to practice early diagnosis, to separate the miner from the exposure, with resulting high possibility of recovery. Rodier refers to the most frequent symptoms: cephalalgia, asthenia, hypersomnia, spasms in legs, arthralgia, irritability. Uiberall considers that the first manifestations to be noticed are the psychological disorders. Among us there is a symptom always observed, which the patients called "weakness of the legs."

Psychological Manifestations

THESE symptoms have been accorded more or less attention among various authors. In Chile, from 64 cases of manganism in study, 53% suffered psychological manifestations, disappearing most of the time with the onset of true neurological disturbances or with no other evolution. Psychomotor irritability is described leading patients to impulsive acts such as deep desires to walk, work, etc. One of the patients we have seen was constantly wishing to walk. He realized that such a desire was abnormal, but could not stop wishing it. Euphoria in some cases, absentmindedness, mental confusion, aggressiveness, and hallucinations are reported. It has been pointed out as a danger occurring during the premanganism period, that victims commit crimes in a stupid way, such as acts of intense psychic impulse.

In Cuba, Diaz Padron, in medicolegal studies, has referred to "transitory toxic psychosis due to manganese."

Neurological Disorders

THE polymorphism of neurological disturbances is one of the characteristics of this intoxication. To some Europeans investigators, in 50% of these cases the neurological symptoms begin between the first and fifth year of exposure. To Cran.n, neurological symptoms are due to a definite "slowing down" control of the voluntary muscles, which explains the tendency to feel tired easily, to have cramps, tremors, as an exaggerated reaction to this "slowing down." Symptoms and syndromes seem to be similar to other extrapyramidal syndromes such as paralysis agitans and progressive lenticular degeneration.

Cephalalgia: It has variable intensity, location and duration due to diffuse brain irritation with slight edema.

Hypersomnia: Somnolence, insomnia. What we have more frequently noticed is restless sleep.

Sensitive muscles: Possibly due to peripheral toxic process.

Lumbago: Mentioned in some texts. In many cases we think they are postural algias.

Gait disturbances: Usually, walking and balance disorders are related. Propulsion: once the victims start walking, it is difficult to stop, especially when on an incline. Retropulsion: when walking backwards, the gravity center is lost and therefore it becomes impossible to keep from falling down. No movement for protection is made. Lateropulsion: Von Jacksh describes the "cock's step" characteristic so called because the foot rests on phalangic metatarsal joints. Occasionally the legs are semi-rigid and at other times are separated widely one from another. Flinn and Neal describe this characteristic: "The gait was spastic in character with marked incoordination in movement."

Speech disturbances: One of the most characteristic manifestations of manganism, during the neurological period is a monotonous tone, and an inability to make the voice louder than a whisper. In many cases it is difficult to understand what they try to say. Pauses between words disappear. Occasionally deglutition is affected. We have recorded the voices of some of these patients.

Tremors: Frequently observed, particularly in tongue, arms and legs. Tremors usually appear while resting and increase when moving. In many cases we observed that the patient was not able to bring a glass of water to his mouth or light a cigarette. Although tremors may appear at any time, they are more frequent during the night. We have seen a case, with generalized tremors, make the bed vibrate.

Fascies: "Mask-like face," "wooden face," "unmovable expression," "impulsive-laughing," "uncontrollable laughter." Pictures of this manifestation, appear in almost all publications on manganism. Although these laughing crises have been described as psychological disturbances, Cranch believes they are a delayed response of the voluntary movement of the muscles. Referring to the muscles of the face, we have not seen described the disturbance of difficulty in whistling, which we frequently find in those cases showing mask-like face.

Handwriting: Irregular, due to the tremors. Micrographia. Tendency of not having any space between words. One of the patients showed us a letter written by him before intoxication and the

Fig. 2.
Mask-like fascies frequently may be observed.

Fig. 3.
When falling occurs as a part of propulsion or retropulsion, no effort is made by the patient to protect himself. This occurrence readily eliminates some malingerers who instinctively seek to check falling.

difference in his handwriting was remarkable. Other patients complained of wishing to write but were unable to move the pencil. (Fig. 6.)

The rest of the neurological findings usually are as follows: no disturbance in cutaneous sensation; Romberg negative; deep tendon reflexes, clonus, and Babinsky, slightly exaggerated. No incoordination. No changes in the eyes or extraocular muscles. The muscular strength usually conserved.

General conditions excellent, with the exception of neurological symptoms.

Other Disturbances

IMPOTENCY: Cohen believes it is of medullar origin; Uiberall, as an expression of brain lesion. Cranch denies it has any relation to manganism. In the cases we have seen, it is one of the most common manifestations.

Twitching of fingers: Observed in hands and feet.

Liver disorders: Hepatomegaly, described by Ceresa, with intense positiveness in Takata-Ara test. Other investigators have not been able to find it. Grevel, in 1941, observed a case with encephalopathy with liver disorders.

Kidney disturbances: Functional disorders of the kidney have not been under the consideration of the authors.

Pneumonia: While Canadian and other North American authors deny relationship between pneumonia and manganese, Europeans describe "manganic pneumonia," stating that if the metal does not act as an etiological agent it does act as a predisposing factor. Dantin Gallego shows that the statistics for Andalusia, in 1934, record deaths in 33% of the cases. In Cuba, although workers frequently suffer respiratory disorders, we have not seen any case of pneumonia caused by manganese.

The climate factor, whenever there is lack of protection and existing difference of temperature between the surface and the bottom of the mine, ought to be important.

Dermatitis: Ceresa mentions the existence of "manganic dermatitis." Cranch denies it. We have seen furunculosis, parasitic acromia, eczemas, and fungus infections. The improvement described by Ceresa with the use of BAL, makes one think that the etiological agent could have been another metal, sensible to BAL. It has been pointed out that the scars of workers with manganism are slowly cured, possibly because of the necrosant action of manganese.

Salivation: Perspiration: frequently observed.

Complementary Examinations

MANGANEMIA: The manganese content in the blood is variable to such an extent that some authors state that if any consideration is given to this test it is necessary to know previously the normal manganemia. It is believed that once in the blood stream, manganese follows in cycles: First phase: circulatory. Second phase: accumulated in different organs. Third phase: elimination.

It is not possible to know whether the manganemia represents the first or the third phase or whether it is the sum of both. Manganemia bears no relation to the length of exposure. High concentrations are found in miners exposed for a short time; low concentrations in others exposed for many years. There is no relation to clinical symptoms, since some patients presenting advanced neurological disturbances have the low manganemia, others, apparently healthy, have a high content of manganese in the blood. It has

been thought manganemia would be an important fact as to manganism prophylaxis, but the conclusion is that it will only be of help in those cases with high content and a tendency to increase. It is accepted that manganemia has no value to prove the intoxication as long as it indicates only that the patient has been exposed to the metal. Rodier states as follows: "We understand we must not continue any investigations on manganemia because of its inconstancy, and it is to be considered only as a sign of impregnation." In Cuba, Delio Garcia Romeu worked on the determination of manganemia by spectrographic methods in nine cases with neurological symptoms. Results are shown in Table I.

Hemogram: In classical books on toxicology it is common to read about polycythemia and leukopenia as symptoms of manganese poisoning. Lymphocytosis and neutropenia are also mentioned. While it has been stated that there is relationship between manganemia and cytologic changes, other authors do not agree. Yugoslavian authors recently published a complete revision of their opinion and reached the following conclusions:

1. A prolonged exposure to manganese oxide dust causes (a) increased hemoglobin values and erythrocyte counts, indicating that manganese stimulates erythropoiesis in the first phase of activity, and (b) decreased monocyte values, indicating that manganese influences the white cell elements in its first phase of activity.

2. In the course of chronic manganese poisoning blood findings show (a) in four cases a decrease in leucocyte values, (b) normal values in the differential blood picture, and (c) normal hemoglobin and erythrocyte values. (Kesic and Hausler: *A.M.A. Arch. Indust. Hyg. & Occup. Med.*, October, 1954.)

Anemia is mentioned by several authors. The cases we have examined frequently presented anemia and eosinophilia, but we soon found these conditions were due to intestinal parasites. There were basophilic stippled cells. We have not found any reference to platelets.

Chemical blood tests: Glycemia, inorganic phosphorus, non-protein nitrogen, all were normal. Often there was reported a slightly lowered calcium content.

Coagulability: normal.

Urine tests: It is pointed out that manganic persons many years after exposure still are eliminating manganese by the urine. Rodier states that manganese in urine means just exposure and absorption but not intoxication. Inconstant increase in coproporphyrinuria. Density, color, and reactions, normal. No alterations of sediment.

Cerebrospinal fluid: Pressure: normal or slightly increased. Aspect, number of cells, normal. Kahn: negative. Occasionally, globulin traces. Reduction in the middle zone of Langer test.

X-ray examinations: No alterations in long bones or in the lungs.

Electroencephalogram: According to reports, performed in eight cases, with some abnormalities in most of them.

Figs. 4 and 5.
The paralyses and consequent limitations of motion in manganese poisoning are varied and striking.

Fundi: Enlargement of the veins and darkening of the pupil edges for the first time are described by physicians from Chile.

Functional liver tests: Takata-Ara, strongly positive (Ceresa). Galactose tolerance test, slightly diminished. Dogan did not believe alterations in these tests.

Liver biopsy: Performed by Dogan and Benton in five cases with normal results. In one case they found a pigment that did not give any reaction to the iron test.

Macro- and microscopic disturbances in the nervous system: "The brain showed atrophy over the vertex and lateral aspects, but not at the base. Microscopic examination showed some diffuse cellular changes in the cerebral cortex and cerebellum, but the significant pathologic process was found in the basal ganglia, in which degeneration of nerve cells, satellitosis, and gliosis were found." (Canavan, Cobb and Drinker.)

Studies made by Voss have shown that lesions are not limited to the brain, as happens at the early periods, but gradually affect the medulla, peripheral nerves and muscles.

In Cuba, we are not aware of any case of death due to manganism.

Classification and prognosis: Uiberall, in accordance with the predominant symptoms, classified the cases of manganism as (1) prodromal condition; (2) sub-clinical cases; (3) clinical cases with inability to work. Groups 2 and 3 are subdivided into (a) acute transitory psychosis; (b) extrapyramidal manifestations; (c) intermediate cases. He also added (1) polyneuritic perispheric syndrome; (2) medullar symptoms; (3) disorders of sensibility.

Flinn and Neal classified the cases as (1) affected; (2) non-affected; (3) non-exposed, when they were examining the employees of an ore-crushing mill.

Rodier classified the miners as (1) apparently healthy; (2) cases to be observed; (3) positive cases of manganism.

With reference to prognosis:

1. Manganism with neurological disturbances—the evolution is generally progressive, although the victim is separated from the exposure. Some cases reach a complete paralysis, others are stationary for years. Partial recovery appears in a few cases. Lesions of the nervous system are irreversible.

2. Cases with psychological disorders—difficult to reach a definite diagnosis. Some of the first cases, in almost every country, are considered as due to drug addiction. If separated from the exposure usually they quickly recover. In many cases in three or four months the psychological disorders disappeared with no other disturbances or, on the contrary, were followed by neurological symptoms.

3. Among those workers who are apparently healthy, there is the possibility that, as the first manifestations are subjective in character, they would not admit the real situation because they want to continue working. As there is no way to determine the degree of sensitivity, and no relation between the length of exposure and the intoxication, there is no way to make a correct prognosis.

This is not a life-shortening disease.

Other circumstances to be considered are:

1. Malingering.

2. Cases that appear three or four months after leaving the mine, feeling perfectly healthy at the time of leaving, develop neurological disturbances that will continue to progress despite no further exposure.

3. An acute illness, especially if it is infectious, may be followed by the first manifestations of manganism.

Treatment

GENERAL: SYMPTOMATIC: Although in several books vitamin B_1 is recommended, Johnstone believes it is contra-indicated because it causes retention of manganese. It is my experience that

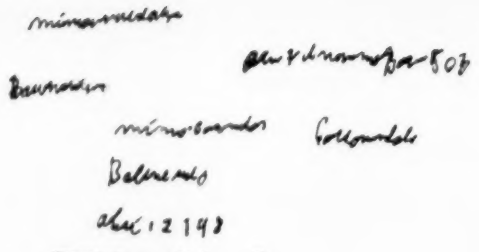

Fig. 6.
This specimen of cramped handwriting (micrographia) is from a well-established instance of manganism in an individual previously a fluent penman.

when polyneuritis is caused by manganese thiamine does not help. We have prescribed vitamin B_6, and the complete vitamin B complex; antiparkinsonism drugs, natural and synthetic antispasmodics; sodium thiosulfate; calcium; liver extract; amino-acids, but have had no results.

Specific treatment: Dimercaprol (BAL): As we have had excellent experience with BAL in arsenic and gold intoxications, we decided to try it in manganism as Ceresa was reporting good results. In 15 cases, we have not seen any improvement. Rodier even accepts the possibility that BAL may activate the toxin manganese.

CaEDTA (Versene): As a courtesy of Riker Laboratories, in 1953 we had the opportunity of administering this new drug to some cases of lead poisoning, with good results. With the purpose of trying to "stop" the progressive manifestations, we administered CaEDTA (calcium ethylenediaminetetraacetic acid) to a number of cases of manganism but we are not enthusiastic about the results.

Last May I wrote to Dr. Jack Schubert, of the Argonne National Laboratory at Chicago, asking about the possibilities of treatment. Schubert believes that at the present time there is no chelating agent sufficiently non-toxic which would be able to eliminate manganese efficiently from the body. "Even if one had a chelating agent which bound manganese even more strongly than EDTA, it is sometimes very difficult for the chelating agent to contact the metal *in vivo*. Those fractions of manganese circulating in the blood and to some extent those in the soft tissues may be mobilized by a chelating agent." Other troubles mentioned by Schubert, are: (1) the chelating agent transports the toxic metal to certain critical organs in higher concentrations than would normally have occurred; and (2) the chelating agent, unless it is strong and present in high concentrations, may, through solution processes, render a greater fraction of the toxic metal more available to react with proteins, enzymes, and other such compounds in the body. Schubert recommends, as a better approach to the treatment of manganism, the use of a non-toxic dye which would form a lake with manganese *in situ*. At the moment he does not know of such a dye. Another possible approach suggested is to inject a chelate salt which would

Fig. 7.
All exposures in the present series derive from manganese ore mining.

break up in the blood stream, and the resulting colloids formed from the metal components could absorb circulating manganese.

With respect to administering CaEDTA as a preventive drug, the first thing to be known is if it really increases the manganese excretion, considering also the possibility that the chelating agent may transport manganese from other body tissues to the nervous system. Johnstone states, "Depending upon a pill for prevention rather than upon the proved measures prescribed by our hygienists is to be deplored. Further, this warning should be proclaimed loudly, frequently, and made conspicuous in all medical journals."

At the present time, we are of the opinion that the only treatment is "Prevention." All dust exposures need be controlled, not allowing a concentration higher than six milligrams of manganese per cubic meter of air through ventilation, wet processes, quarterly medical examinations, personal hygiene such as bath after work, frequent change of work clothes, long periods of rest after acute processes, proper alimentation, etc. Only by such means can protection be obtained until better methods are devised.

(Ave. de Simon Bolivar 67.)

Changes Sometimes Hurt

PERHAPS the spread of union welfare plans has brought us to the verge of a time where we must think in bold terms of a total solution of our health problems . . . . Both management and labor want to see that the beneficiaries get everything possible out of the welfare plans that have been set up, and that any increase in premiums is passed along in the form of benefits, not dissipated. . . . cooperation from the medical profession has become most important at this stage of the game. . . . labor, management, and the medical profession should join in attempting to guide the future development of these welfare plans along the most helpful channels . . . . The more unions understand exactly what is possible and what their health and welfare funds will buy, the more formidable they will become as bargainers. Such bargaining may involve change, and changes sometimes hurt . . . . Perhaps medical societies, by bargaining freely and sincerely, can help shape and direct these changes . . . . (Too frequently) organized labor and organized medicine are standing pat on their cliches rather than trying to work together. Sometimes the attitudes on either side seem to be so stereotyped that neither can appraise the other realistically and objectively. Yet events are inexorably bringing labor and medicine closer to interaction . . . . I believe that both labor and the doctors should welcome every opportunity to get acquainted with each other, size up their common problems and look ahead to their solution . . . . Dependable high quality medical service is the real fundamental essential, in whatever form medical service may be supplied. We know that unions are seeking more complete medical care for the workingman's family . . . . Insurance indemnity is helpful, but it is only an economic answer to the need, as I see it. People want service, freedom to drop into the doctor's office . . . . and ask questions about the simplest and most trivial matters. They want the comfort of having a source of information and service to lean on. I have seen the value of this over the years in my industrial experience. Answering questions about a myriad of symptoms and changes in function means more than we may realize. Furthermore, this form of early diagnosis and treatment very often avoids the necessity of more prolonged care in the hospital.

—From "Union Welfare Funds and the Doctors," Address by WILLIAM A. SAWYER, M.D., at the First Interstate Scientific Assembly, Washington, D.C., November 1, 1954.

Plant Preventive Medicine Pays

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NO MORE intimate aspect of good human relations exists in business today than its industrial health and safety programs. If a company has a medical program the employee expects that program, and the plant physician representing it, to bring him beneficial results. Preventive medicine is the largest single benefit we bring to the employee in industrial medical practice.

The most important preventive measures are the various industrial physical examinations. These include: preplacement, periodic or annual, post-illness, and special examinations. Their purposes are:

1. To facilitate placement of a worker in accordance with his individual physical or mental fitness.

2. To acquaint the worker with his physical status and to assist him in improving and maintaining his own good health.

3. To safeguard the health and safety of others.

IN THE light of these objectives, it is evident that the worker profits at time of hiring by proper placement in a job compatible with his physical capacities; and that he profits also from advice as to correctible defects which, though minor at first, could be aggravated over years of service and reduce his working efficiency. By reporting to his private physician for correction of these defects, he improves his health and increases his longevity, bringing long-range benefits to his family and his community. The private physician benefits by referral of the case at a time, in many instances, early enough to prevent irreparable damage; he is able to follow the case from the beginning and maintain proper medical control. Management benefits in receiving advice, without diagnosis, as to the individual's physical capabilities and limitations; thus enabling the worker to be placed in a proper job.

THE PERIODIC or annual physical examination is another important preventive measure in an industrial medical program. Its purpose is to counsel the employee throughout his working career, to assist him to improve and maintain good health. It also is a measure to safeguard the health and safety of others, and to discover and control the effects of possible unhealthful exposures in the working environment. The periodic physical examination consists of:

1. Recording a complete medical history, in addition to a health questionnaire filled out by the examinee.

2. Doing a routine evaluation of the various systems of the body, which may include sufficient laboratory procedures to be able to advise the employee as to the need for treatment by his private physician.

These examinations yield but few temporary losses of position or income. Only a small number of employees (less than .5%), with certain disabilities of a temporary or permanent nature, suffer temporary or permanent economic losses in reassignments, lack of promotion, or termination because of physical condition. On the other hand, all employees benefit by being apprised of physical defects early and, in most instances, before irreparable damage has been done. In thus preventing serious prolonged disability, in most cases we keep the employee advantageously on the job. He does not use all of his sick leave, and he suffers little or no economic loss.

In effect, where these periodic examinations are concerned, we are operating a well-adult clinic where sufficient diagnostic study is made to determine that the employee does or does not require medical care. The examinations may disclose, for example, early cancerous and precancerous lesions, communicable diseases, early diabetes, overweight, coronary insufficiency, early hypertension. By doing a limited amount of preliminary laboratory study, we frequently are able to convince employees that they should go to their private physician. Some otherwise might delay such a visit for months or years. The physician in industry, therefore, benefits his employer and the community by keeping the maximum number of workers functioning. He guides the employees into acceptance and correction of defects—and this is a major benefit. He directs the employee, through these examinations, toward the use of the talents of the private practitioners in his community. The private physician benefits by more frequent contact with his patients and at a time when he is in a position, in many instances, through curative medicine, to prevent serious disability. Approximately 50% of our employees who are examined each year are found to have defects requiring correction and are referred to their private physicians or dentists. This phase of industrial medicine can properly be called preventive, constructive, educative, and/or anticipatory medicine. This is in contradistinction to

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curative medicine which is the primary responsibility of private practitioners.

ANOTHER important function of the industrial physician is the evaluation of the physical condition of employees returning to work after illnesses. These examinations clearly benefit the employee, the company, and the private physician. The private physician, by virtue of the patient-physician relationship, is properly a champion and advocate of his patients' welfare. However, in cases of short-term illnesses, he is frequently called on to certify the disability of his patients at a time when they have recovered and present no objective findings. In many such situations he must face the possibility of an irate patient, a loss of the patient's confidence, or unwittingly becoming a partner to some unjustified claim of illness. In some cases the certification of personal illness by a private physician is expected by the patient upon the basis of economic rather than strictly medical factors.

We look with equanimity upon matters concerning the certification of illness. We have found that in the majority of questionable cases, personal contact with the private physician explains and justifies many situations which are not justified on paper. I need not emphasize that "rubber-stamp" certifications by private physicians are not only harmful to morale, but also make no contribution to the worker's mental health. There are some cases where we must recognize "the adult version of the boyhood headache allowing baseball on Saturday but preventing church on Sunday." Close cooperation with industrial physicians can help to maintain smooth patient relationships for private practitioners in these difficult situations.

A plant physician frequently examines a workman returning after a serious illness. Some of these examinations involve conditions such as coronary disease and cerebral accident, and patients may ask to be returned to work by private physicians prematurely because of economic factors which may outweigh medical considerations. In such instances, the plant physician should have the final responsibility for determining the patient's physical limitations as they relate to his job. The plant physician is in a better position to understand the job requirements, working conditions, and possible occupational hazards in a given plant. He is also aware of the number of light-duty or modified-duty jobs available, and can discuss, with the industrial relations department or supervision, placement possibilities for the employee. This arrangement is a benefit to the employee in the prevention of further aggravation of his disability. It is also a protection to the company from the standpoint of occupational aggravation of a pre-existing disability.

In such instances the plant physician may contact the private physician and furnish necessary information on job requirements, working conditions, or potential hazards. The private physician is then in a better position to discuss with his patient the need for further treatment and observation before returning to work. On the whole, this procedure establishes good relations with physicians in the community and strengthens the physician-patient relationship.

Occasionally a decision of the Medical Department, as a result of a physical examination, becomes a labor relations matter. We have found that these situations can be resolved amicably by a frank discussion between the plant physician and union representatives. Such approaches to the Medical Department are made through proper industrial relations channels. Unions will now and then present medical evidence from the employee's private physician. Such evidence sometimes is incomplete. Laboratory or x-ray examinations may have been done at the plant which were not performed in the private physician's office; or the practitioner is not familiar with the employee's work or may have a distorted opinion of it as presented by the employee. In such instances, we explain the situation to the union representative and offer to communicate with the private practitioner. The medical ethics governing these communications are the same as between any two private practitioners. If we cannot reach an agreement, we will offer the patient an examination by a specialist in the particular field of medicine involved. On occasion we have changed our opinion regarding the diagnosis as a result of such a consultation. Once the diagnosis is established, however, the plant physician's opinion is final in regard to the physical limitations as they relate to placement in the job.

Thus we have a situation, on physical examinations in industry, where there can be a valid interest involving the prospective employee, the union, the company, and the private practitioner. An important skill the industrial medical practitioner brings to his work is the ability to get all of these parties to agree.

An industrial physical examination *cannot* be used as a tool for unjust exclusion from employment or to narrow the field of competition in obtaining jobs or job promotion within a plant. This is the broad principle which must serve the interests of all. However, a company has a moral responsibility to new and old employees in seeing that they are placed in jobs they can perform efficiently without being a hazard to themselves, to others, or to company property. Somewhere between these two broad interests lies the basis for teamwork between the industrial physician and his colleagues in private practice. Industrial medicine has progressed a long way in coming to the realization that we must consider a man's abilities rather than his disabilities. Our approach to this concept must still be tempered by realism and with some consideration of the employer.

In most states, the aggravation of a pre-existing disease or disability, is compensable under law. We must be diligent, therefore, in seeing that persons with certain disabilities are not placed in jobs where there is the hazard of costly aggravation of these disabilities. So much for the various examinations in which we, in industrial medicine, participate.

PERHAPS the earliest of the several functions identified with industrial medicine was the emergency treatment of industrial injuries. This once accounted for most of the effort in the field of industrial medicine and was the source of most of the hostility of which that field was the unhappy heir. Today, that has changed. The emergency treatment of industrial injuries has faded into a position of lesser importance, and the hostility it once engendered has largely disappeared.

Years ago when the management of a company evaluated its Medical Department it was primarily on its ability to minimize the cost of medical care in those instances where the company had a legal and financial responsibility for this care. This goal often was best achieved by part-time surgeons and nurses. In some instances this reparative service may have been provided on a mass production basis and, occasionally, at cut-rate prices. The worker was frequently the victim, and the reputation of the field of industrial medicine suffered. Today such unfortunate situations are practically non-existent.

Preventive medical programs and accident prevention programs in large industry, especially in the oil industry, have developed industrial hygiene preventive engineering to a high level of performance. This has changed the whole picture so that occupational injuries and diseases now account for only a small portion of the total cost of illness to industry. In General Petroleum we are proud of an outstanding safety program and safety record. The cooperation of medical, safety, and industrial hygiene personnel, and top management has achieved savings in human suffering, disability, insurance loss, and lost time which are phenomenal. Many of our operations, including refineries, have proved to be safer than the home, field, or highway.

Our costs for accidental injuries and occupational diseases are less than one-third the sick leave costs for non-occupational illness and injury. Nevertheless, the nature and location of our oil refinery operations still make it imperative, in the interests of our workmen, that emergency medical facilities be available at the plant. The workman who is injured in an oil refinery expects, and rightly so, to receive the finest emergency medical care as soon as possible, and he looks to the company to bring this to him. His family is aware of some of the inherent hazards of his work and they, too, expect the company to have available emergency care. In General Petroleum this care is given with the understanding that the employee will be sent to the nearest approved hospital for further treatment and also that we will make full use of the best specialists and consultants in the community, depending on the nature and extent of the disability.

By furnishing prompt and efficient emergency treatment of industrial injuries and diseases at the plant we are able:

1. To establish the fact of injury usually without controversy.

2. To determine the nature and extent of the injury or illness.

3. To make necessary arrangements for referral to outside medical offices or hospitals for complete care. (In some states in accordance with the patient's choice of physician.)

4. To furnish a report to the state immediately.

5. To arrange for immediate notification of the family in case of serious illness or injury.

6. To make necessary arrangements for differential sick pay in case there will be lost time.

7. To discuss with our safety department the cause of illness or injury so that it can be investigated and measures recommended immediately toward prevention of future accidents or illness.

8. To discuss with industrial relations the placement of the injured employee according to his remaining physical capacity.

In days when we had no in-plant medical program, the employee and the company suffered losses. Many injured employees with a "wait and see" attitude delayed reporting to outside physicians. Reports to the state were delayed, and it was frequently impossible for the safety department to get a complete investigation of the circumstances surrounding an injury or illness. In a few instances workmen went home with minor injuries and "rested" for days or weeks on sick leave. In those cases where the facts of injury or illness and other circumstances could not be clearly established, it was difficult for our outside physicians to determine whether the employee's complaint was compensable.

With our present in-plant medical service at the refinery, claims before the Industrial Accident Commission, which were formerly rather frequent, have now become a rarity; and prolonged disability, complications, and permanent disabilities have been reduced to a minimum. Any plant physician is in a unique position in cases of occupational injury or disease. He frequently must walk a tight-rope and balance relationships between management, safety, insurance, union, and family physician. Our results have been good.

AS THE industrial field becomes more complex, and as the people in it become more accident-prevention minded, it has logically followed that the field of environmental hygiene is becoming increasingly important to the industrial physician. Here again the medical man's special training enables him to bring benefits to the company, the employee, and the community. New processes involving new chemicals are being developed every day to produce new and better products for the public. This is especially true in the oil industry where constant research is in progress to improve petroleum products. This trend is indicative of economic health. The refining of petroleum, however, requires the constant vigilance of safety and industrial hygiene engineers and industrial physicians.

A modern refinery, operating properly, is a well closed system of pipes and tanks where crude oil is subject to heat and various catalytic reactions in order to produce different fractions or products ranging from coke to high octane avia-

tion gasoline. Some of the common chemical compounds used in the refining of crude petroleum are sulfuric acid, hydrofluoric acid, sulfuric dioxide, litharge, amorphous alumina and silica clays, and various caustic solutions. These substances are used as catalysts in refining petroleum or in the treating of refined petroleum in order to remove objectionable substances. In the process of refining, various gases are produced which can be detrimental to health if liberated in work areas in sufficient concentration. The most important of these is hydrogen sulphide.

The elimination and control of occupational hazards, due to various gases, solvents and dusts, is a responsibility of the Medical Department working with other departments. Through industrial hygiene measures these hazards usually remain under control. Occasionally, however, in the repair or maintenance of a unit, toxic gases or catalysts may escape in sufficient quantities to cause toxic effects through inhalation or skin contact, depending upon the chemical involved.

There are special problems connected with the diagnosis and treatment of these exposures which require knowledge of the chemistry and toxicology of the substances involved. For example, treatment of a hydrofluoric acid burn is different from that of other burns because of progressive penetration of the acid. The hydrous or the anhydrous form of acid may be involved. The hydrous burn frequently is a delayed reaction, whereas the anhydrous effects are immediate and blanching is apparent. First aid is extremely important and depends upon the location of the burn and the degree of penetration. The less severe types can be treated by a copious flushing of water, saline or ammonia solution, followed by the application of a special salve containing magnesium oxide, glycerine, and magnesium sulphate. Oil-base ointments or salves as wound coverings are contraindicated. Others with more penetration should be treated by removal of the superficial layer of the skin, and this can be accomplished with sandpaper. Deeper burns, involving the corium, are treated either by infiltration with 10% calcium gluconate solution, by debridement, or by more radical dissection of the tissues involved.

This type of occupational injury is only one of the special problems we meet in the oil industry. We have a large number of solvents or petroleum fractions with which the workman may come in contact, which can be highly irritating to the skin of susceptible individuals and cause industrial dermatitis or, with chronic exposure, hyperkeratotic lesions on the face and hands. In this regard, supervision of personal hygiene is an important responsibility of the plant physician.

Owing to the complexities of modern industrial processes a private practitioner may unwittingly become a party to an unwarranted claim of occupational disease or injury. Employees occasionally make a diagnosis of occupational disease on hearsay. Relatively few employees know all of the specific occupational hazards in their working environment. I have seen instances such as where an employee, on the basis of hearsay, has influenced a family doctor to make an unreasonable diagnosis of hydrogen sulphide gas inhalation poisoning, although, as was later proved, the employee did not work anywhere near the alleged exposure to gas, and his symptoms were due to coronary disease. In such cases we welcome inquiry from the private physician and are happy to discuss all possible health hazards to help make a diagnosis.

ANOTHER area into which the industrial practitioner is being drawn is that of mental hygiene. It has been reported that the employee whose wife throws dishes at him but misses is a potential emotional problem when he's on the job. He is also a potential accident and a potential source of poor morale and reduced job satisfaction to his fellow employees. Mental hygiene is becoming increasingly important to industry because of such potentialities, and the industrial physician is frequently called upon by foremen and supervisors who see cases of employees showing evidence of emotional problems, occupational and non-occupational. Thus many of these cases are seen first in the industrial Medical Department. They do not necessarily call for a psychiatrist, but rather for a doctor who has been taught something of psychological and emotional reactions, and who knows the temperament of the individual and his occupational situation, and has time to confer with him. By spending some time listening the industrial practitioner can frequently recognize home, family, and financial worries, as well as problems relating to other employees and supervision. In recognizing the interplay of these stresses we frequently are able to help an individual gain an understanding of his behavior.

The "good old" country doctor relationship consisted mainly in good two-way communications between the doctor and the patient. In a busy private office these communications may be difficult, especially in these days of specialization. Many industrial physicians are helping to hold this gateway of communication open. In so doing, industrial medicine has brought benefits to the medical profession at local and national levels. On the whole, it has done an informal but effective job of human and public relations with the working man or woman, union or non-union, during the crucial years when the balance could easily have been tipped toward state control of medicine.

So there we have the elements of a plant medical program, conceived and dedicated under the principle of beneficial service to the community, the employees, and the employer.

TO BE effective, any industrial medical program must be implemented by health education through various media, such as literature, films, health talks, and articles in the company house organ. Various subjects including nutrition, health hazards, physical fitness, communicable diseases, hobbies or avocations, and first aid are covered with a view of "selling" health benefits

to the employees. Results of health education are poor unless we are able to penetrate Zone 1 of the reader's or listener's viewpoint; get his favorable attention and interest; and arouse a desire, and then a decision to accept certain ideas related to positive health maintenance. Here we must be guided by the principle that people think and act in what they feel are the best interests of themselves, their families, and those whose welfare they have at heart. Health education media therefore must have a strong appeal to the listener's point of view, provide clear-cut benefits resulting from good health habits and point out definite losses due to poor health habits.

We have found that health education based on these principles brings results. For example, during the past few years we have emphasized in a General Petroleum health education program the relationship of overweight to health. We can actually measure our results in pounds. We estimate that for the executive payroll alone there has been a weight loss of 2,500 pounds over the period from January, 1952, to date.

In the administration of an industrial medical program a system of confidential health records is essential. By keeping our medical information confidential we gain employee confidence, do a better job in preventive medicine, and improve health and longevity. On the other hand, if there is unreasonable disclosure of confidential medical information to management, supervision, or others, we bring about a loss of confidence in the medical program, hamper our efforts in obtaining good physical examinations, and cause a breakdown in preventive or constructive medical measures. For these reasons maintaining confidential and medical records, aside from medical ethics, is good policy and brings benefits to our employees in terms of better health and longer lives. The private physician benefits in feeling free to discuss a case with the plant physician with a knowledge that his communication will be handled in a manner that will protect his ethical relationship with the patient.

Now to summarize: An effective medical program pays management in these ways:

1. It helps to produce higher morale among employees—it is evidence that management has a sincere interest in its employees and their welfare.

2. It helps improve worker productivity.

3. It helps to reduce accident costs and insurance costs.

4. It improves the quality of the organization's working force (a) by attracting better people to the organization; (b) by giving a better selection of people from which to "tailor" a good employee team; (c) by reducing absenteeism; (d) by extending the productive life of the company's greatest resource, its employees, and keeping them fit until normal retirement date; and (e) by reducing turnover.

5. It gives management another channel of communication with employees. This factor is doubly important because management gets the benefit of the trained observation powers of professional men of high integrity who will give honest, accurate, and pertinent opinions on management's effectiveness in its communications efforts and particularly its shortcomings. (This last is a rare and valuable thing.)

6. It increases acceptance of the organization by the general public. This produces a better reputation in the market place, increased confidence from investors, and a more cooperative attitude from regulatory bodies.

There can be no question that benefits of a plant medical program go far beyond the walls of the plant, and these programs are making an ever increasing contribution to the betterment of community health standards.

Challenge or Competition

A CHALLENGE is a test that an individual sets himself to meet. It is an accomplishment that he wishes to perform because he has an urge to do so. A dare is something urged, foisted or forced upon an individual—something he may be taunted to perform. If he is immature he accepts a dare and thereafter chafes under it even if he accomplishes it. Dares often breed intense competition, which may be stressful experiences. Competition with its attendant stress and tension is a natural concomitant of work. But play, which is intended to relieve stress and tension should not be a stressful experience in itself particularly in creative workers for stress creates, but does not relieve, mental fatigue. Management is therefore gradually realizing that social company activities if thoughtlessly designed negate the very purpose of relaxation they are intended to serve. Pointless competitive endeavors at play may give a sense of accomplishment to overaggressive and compulsive individuals but in creative workers, artificial puerile competition is stressful, which is not conducive to the period of regeneration that a creative mind must periodically have.—From the *Monthly Bulletin of Di Cyan & Brown*, September, 1954.

Aspects of Occupational Dermatoses

WITH PARTICULAR REFERENCE TO TREATMENT AND CHROMATE DERMATITIS

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AT A MEETING *of the Chairmen of the Scientific Committees of the Industrial Medical Association at the Industrial Health Conference at Chicago last April, it was suggested that* DR. KLAUDER *as Chairman of the IMA Committee on Dermatology arrange for a paper on occupational dermatoses, discussing treatment, the status of therapeutic agents, such as ACTH and Cortisone, and other practical aspects and sources of information—this in the nature of a rather comprehensive review. The following presentation by* DR. KLAUDER *and* DR. COMBES, *a member of the IMA Committee on Dermatology, is the response to that suggestion*—ED.

Penicillin Reactions

INCREASING reports of reactions to penicillin are appearing in American and foreign literature.[1] Particular mention is made of a survey of this literature by Smith and Walker[2] and the comprehensive report of Kern and Wimberley.[3] The use of penicillin by industrial physicians (see Case 1) makes timely a discussion of these reactions.

Of medicinal agents in current use penicillin heads the list in frequency, diversity and severity of the sensitivities which it induces, and has replaced foreign sera as the commonest cause of fatal anaphylactic shock.[3] Penicillin has been compared to the sulfonamides. In the initial period of their use there was little evidence of toxic reactions. Subsequently, their widespread use in every trifling infection soon evidenced that they were potent sensitizers.

The incidence of all toxic reactions is given by some writers as high as 10%; for the urticarial type about 5%; and sensitization arising from its local use as high as 40%. The majority of patients who experience any type of reaction have had previous administration of penicillin; rarely does reaction occur after first administration. The increasing and widespread use of penicillin in repeated courses reasonably explains the increasing number of reactions. For example, Pillsbury *et al*[4] reported in 1947 an incidence of urticaria in 1.8% of the first 824 cases treated; whereas, of the 200 cases re-treated the incidence rose to 6%. Of the 18 cases of anaphylactic deaths from penicillin reviewed by Kern and Wimberley,[3] five were asthmatics. An additional eight cases of death following the injection of penicillin are reported by Rosenthal.[5] These cases were among a series of sudden deaths investigated by the Chief Medical Examiner of the City of New York. Kern and Wimberley comment that since 15% of our population are of such major allergic constitution, it is clear that one in every seven patients given penicillin is a candidate for eventual penicillin sensitivity.

There is evidence of cross-reaction of sensitivity to penicillin and some pathogenic fungi. It has been suggested that such cross-sensitivity exists to penicillin and related moulds. These circumstances are given to explain some of the reactions after first administration of the drug and also partly to explain the high incidence of sensitization reactions.

The following evidences the multiplicity of the forms of reaction to penicillin:

Anaphylactic reactions constitute the most alarming and dangerous manifestations of penicillin sensitivity. Exfoliative dermatitis and periarteritis nodosa contribute additional deaths. Of the 18 anaphylactic deaths reported in the literature and reviewed by Kern and Wimberley, as aforementioned, five were asthmatics. Many gave a history of allergic diseases, of previous administration of penicillin, of whom some had minor reactions. On the other hand, anaphylactic death occurred in persons who had no history of allergy or previous administration of penicillin; e.g., a 27-year-old male who died 20 minutes after an intramuscular injection of procaine penicillin in peanut oil with aluminum monostearate, given for a "cold." There was no previous history of allergy and no history of prior administration of penicillin. Of the 18 fatal cases, death occurred in as brief a period as 15 minutes before treatment could be administered, and in others, in a few hours to several days.

Asthma. This is more likely to occur after inhalation of penicillin. We observed an employee of a pharmaceutical company who perfected a nasal inhaler. Over a long period he frequently tested the apparatus on himself. He became sensitized, expressed as asthmatic attacks. The latter also appeared when in the room where penicillin was being processed.

Contact Dermatitis. This may occur after local use of penicillin—ointments, compresses, sprays, powders. We observed it in industrial workers engaged in making penicillin. It is desirable that preventive measures applicable to handling allergenic substances be enforced for workers exposed to penicillin. Contact dermatitis also occurs among physicians and nurses handling penicillin preparations. According to Bamber[6] 10% of the district nurses in Liverpool have become sensitive to either penicillin or streptomycin or both.

Local Reactions. Swelling and itching at site of injection. In this category may also be included reactions in the mouth after the use of troches, gastric disturbance after oral administration, and "flare up" of fungus infection, notably of the feet, accompanied by an "id" reaction elsewhere on the skin.

Dermatoses. These are variously expressed. The mildest reaction may be pruritus with a fleeting erythematous outbreak. The outbreak may be punctate, morbilliform, scarlatiniform, erythrodermia, exfoliative dermatitis, erythema multiforme-like, generalized bullous eruption, or lesions resembling erythema nodosum. We observed localized recurring bullous lesions following urticaria. Accompanying pronounced eruptions there is usually fever, systemic symptoms, at times joint pains and visceral complications, such as renal shutdown.

Urticaria. This is the commonest untoward reaction. It may appear two to three days up to near two weeks after penicillin treatment. Frequently there are joint pains in which event it is designated "serum sickness reaction." We would grade urticaria as mild, moderate and severe. Pruritus is conspicuous and may precede, for a brief period, an outbreak of urticaria. Angioneurotic edema may or may not be present. Other than the mild cases, there is usually fever and at times eosinophilia. Mild cases may be of brief duration. We have hospitalized patients with pronounced urticaria as long as two weeks. The longest duration we observed urticaria to persist was three months. Longer periods have been reported; Kern and Wimberley record three to 15 months. In such instances these authors believe that other allergens (notably food) come into the allergic mechanism that penicillin initiated, and that this possibility should be considered in treatment.

Only mention will be made of the following reactions reviewed in Kern and Wimberley's report: Purpuric eruptions, agranulocytosis, periarteritis nodosa, peripheral neuritis, severe hydroarthrosis, albuminuria, protracted fever, and Loeffler's syndrome.

One of our patients who had pronounced urticaria after penicillin treatment had acute abdominal pain two days after discharge from the hospital. Rupture of the spleen was found on operation. There was no injury or other explanation.

Prevention. Before administering penicillin Kern and Wimberley stress importance of history concerning previous penicillin treatment, of reactions and history of allergy When patients have an allergic history or have had reactions to penicillin they advise a cutaneous (scratch) test with a drop of the preparation to be used. Erythema and wheal formation constitute a positive reaction and evidence marked sensitivity. In this event, administration of penicillin is hazardous. The cutaneous test is advised before the intracutaneous test—injection intracutaneously of 0.02 cc. of penicillin solution with 5,000 units per cc. Wheal and erythema in 20 minutes indicate a dangerous degree of sensitivity. A delayed reaction in 24 to 48 hours indicates much less danger of anaphylactic reaction, but with the chance of some allergic response.

Kern and Wimberley express the opinion that concomitant administration of an antihistaminic applies only to the lesser types of penicillin sensitivity.

The procedure is useless in the face of anaphylactic sensitivity.

In prevention of penicillin sensitivity and of reactions all writers emphasize that penicillin should not be used in treatment of trifling infections or injury and that consideration be given to the use of other antibiotics.

Treatment. Treatment only of the urticarial reaction will be discussed. We do not regard routine use of cortisone or corticotropin (ACTH) as necessary, but reserve their use in pronounced cases or when the following measures are ineffective: an antihistaminic and calcium gluconate orally, and calcium gluconate intravenously; ephedrine sulfate by mouth and adrenalin hypodermatically for angioneurotic edema; sedation through the day and at night codeine if necessary to induce sleep; colloidal baths—one pound of laundry starch to the tub of tepid water. Local treatment is recorded in Case I:

CASE 1. An industrial worker bumped his elbow on a machine. The site of injury became red and swollen, for which reason 300,000 units of penicillin were given intramuscularly on February 3, and repeated on February 5. On February 14, urticaria appeared on the forearms. In the ensuing 10 days it became generalized with swelling of the feet preventing the wearing of shoes. He had no knowledge of ever having previous penicillin treatment. He was hospitalized from February 24 to March 2. Treatment consisted of calcium gluconate orally, one teaspoonful three times daily; calcium gluconate was also given intravenously. An antihistaminic and ephedrine sulfate were given orally. Adrenalin was injected when he complained of difficulty in breathing (apparently from tracheal involvement); codeine was required to induce sleep. From February 24 to 27, ACTH gel was given intramuscularly for a total of 100 units; locally a shake lotion—sodium borate 4.0, pulv. zinc oxide 8.0, isopropyl alcohol 30 cc., aqua calcis qs. 180 cc.; compresses of boric acid solution; at night free application of powdered talcum containing 3% menthol.

He resumed work March 8.

Dermatoses from Chromates

REVIEW is made of two comprehensive studies of the hazards of chromium and its compounds in industry—one a U.S. Public Health report,[7] the other by Walsh.[8]

The U.S. Public Health report is an exhaustive study of the health hazards of workers engaged in the manufacture of chromates and bichromates from chromite ore. It describes manufacturing processes, examination of air-borne materials and medical examinations of 897 workers including incidence of bronchiogenic carcinoma from inhalation of chromate-containing dust. The incidence is far above that found among a comparison group. Walsh's report discusses the commoner uses of chromium compounds in industry, and the various medical complications that may arise from such use, particularly chromate dermatitis.

Chromium and its compounds are widely used in industry. Only dermatoses arising from their use will be discussed. These comprise dermatitis from primary irritant action, sensitization dermatitis, and chrome ulcer. Mention may be made of nasal perforation (arising from exposure to mists or dusts containing chromate), yellowish discoloration of the anterior teeth, and yellowish coating of the dorsum of the tongue. These were present in a certain percent of chromate workers, in the U.S. Public Health report.

The hazard of dermatoses is in relation to the nature of chromium compound. The bivalent chromous salts are unstable and of no commercial importance. Trivalent and metallic chromium are apparently not irritating, non-toxic, and non-allergenic.* The hexavalent compounds, such as sodium and potassium dichromate are mostly widely used and are the only forms that pose any problem from an industrial health viewpoint.

Dermatitis from irritant action of hexavalent compounds is usually caused by concentrated solutions, such as used in chrome-plating and in anodizing, another electrolytic type of anticorrosive treatment. In these processes a concentration of chromic acid as high as 40% is employed.

Other important uses of hexavalent compounds are in photoengraving, lithography, blueprinting, as a mordant or fixative for the dyeing of woolen cloth and fur, and in the dyeing of some leathers. The "two-bath" chrome tanning of leather employs sodium dichromate; in the "one-bath" process trivalent sodium chromic sulfate is used.

Chromium compounds used in paints, ink, rubber, and ceramics are lead and barium chromate and chromium oxide. These are insoluble and are doubtful causes of dermatitis. An exception is the use of zinc chromate.

The most frequent source of chromate dermatitis in industry is sensitization dermatitis. Chromium stands high on the list of allergenic metals

Fig. 1.
Sensitization dermatitis from chromate. The patient worked in an aircraft factory, handling parts painted with zinc chromate primer. He had erythematous eczematous dermatitis of the hands, forearms, and face. Of the face, the eyelids were more affected. An open patch test with the primer was positive, and was negative in a control subject.

(nickel, mercury, cobalt, beryllium). As aforementioned, it is generally stated that only hexavalent chrome compounds are sensitizing.* Sensitization dermatitis appears after variable periods of exposure and to concentrations below that of primary irritant action.

One source of sensitization dermatitis is zinc chromate primer used as a corrosion inhibitive paint on most aluminum and magnesium airplane parts after anodizing. It is similarly used in the shipbuilding industry and also as a paint on other metals. Sensitization dermatitis occurs not only in painters spraying the primer, but also in others handling the painted object (Fig. 1). Another source is exposure to a solution of chromate (usually less than 1%) used as an anticorrosive in various types of recirculating water systems in Diesel railroad locomotives and some other internal combustion engines. For the same purpose chromate is used in refrigeration systems, in the brine in ice plants, and in some air-conditioning installations.

Chrome ulcer caused by the necrotizing action of the chromate ion is a rounded ulcer with a punched-out appearance and a raised well-defined hard border (Fig. 2). It is slow to heal and more readily occurs at site of a break in the continuity of the skin. In the U.S. Public Health report

*AKATSUK and FAIRHILL (Toxicology of Chromium, *J. Ind. Hyg.*, 16:1, 1934) administered to cats in food 1,000 mg. daily of chromic phosphate or chromic carbonate, or by inhalation 200 mg. of chromic carbonate for 17 weeks. None of the animals showed evidence of toxic effect.

*It is generally stated that chrome in chrome-tanned leather combined with protein is in trivalent form and likewise in wool dyed with a chromium mordant. Chromium-plated metals are coated with metallic chromium which is inert. These materials theoretically should not be allergenic causing sensitization dermatitis. We, therefore, performed patch tests with these materials (obtained from the manufacturer who certified that a chromium compound was used) on persons who had sensitization dermatitis to dichromate. The results were negative in contrast to positive result with dichromate. In these patients negative patch tests also resulted with trivalent chromic acetate 1% solution (Cr_2O_3 equivalent, pH 5.2). Bering and Zitzke (Berufliche Hautkrankheiten, Von Leopold Voss, Leipzig, 1935, p. 52) similarly observed negative patch tests with trivalent chromic chloride.

Fig. 2.
Chrome ulcers in a tannery worker showing the characteristic punched-out appearance and raised well-defined borders. They resemble the eye of a bird and pertinently are termed by the French "pigeonneau." Similar ulcers are caused by lime, solutions of cyanide, and other caustic agents.

49.5% of white workers examined had chrome ulcers or scars thereof; 11% had active ulcerations. Such ulcers are well-known in the tanning and electroplating industries.

Chromate dermatitis from primary irritant action is confined to the site of direct contact, invariably the hands and forearms, whereas sensitization dermatitis in addition to the site of direct contact, may appear elsewhere, especially the face (through contact with the hands), at times only the eyelids (Fig. 1). In our experience chromate dermatitis, comparable to any dermatitis arising from either primary irritant or allergenic cause, progressively improves and disappears after cessation of exposure. Other writers state that chromate sensitization dermatitis may pursue a longer course (after cessation of exposure) than that arising from other contactant causes. The opinion has been expressed that chromium may remain in the skin. We know of no documented evidence to rationalize this hypothesis. In treatment of these protracted cases Cole[9] advises topical use of dimercaprol (BAL—3% in ointment) and also intragluteal injections of dimercaprol.

Patch Test: Closed Method vs Open Method. The generally recommended method is the employment of 0.5% solution of sodium or potassium dichromate by the closed method. Several layers of gauze (½- to ¾-inch square) are wet with the solution, covered with wax paper and held on the skin by adhesive for 24 hours. The site of application is read in 24 hours and again in three to four days for delayed reaction. Walsh advises 0.25% solution as a better test dilution.

Patch testing in diagnosis of occupational dermatitis is invariably to diagnose sensitization dermatitis. If a positive reaction with the tested substance is obtained, the question is pertinent—does such reaction represent a primary irritant or an allergic reaction? This would not apply if the tested substance has no inherent irritant action—rubber, tobacco, nylon, wood. It applies to all substances having an inherent irritant action. If concentration of an irritant is highly diluted .01%, .001% in order definitely to eliminate irritant action, such dilution may yield a negative reaction yet the tested person may be allergic to the substance, but not in the degree represented by the dilution. In patch testing if only one concentration of a substance that is inherently a primary irritant is employed, it may be difficult to define where primary irritant action ends and allergenic action starts.

In between high and lower concentrations of a primary irritant there is a borderline concentration that yields variable results in patch testing. This reflects the variation in irritability of the "normal" skin. Such borderline concentrations are more likely to show uniform positive reactions on the uninvolved skin of patients with eczematous dermatitis in relation to its degree and extent. Consistently Klauder[10] observed that 75% of 18 patients with fairly diffuse acute eczematous dermatitis (without evidence of contactant cause) showed positive reactions to closed patch test (on the uninvolved skin) with 0.5% dichromate solution.* In a patient (never exposed to chromate) with acute diffuse eczematous dermatitis he observed the following results of patch tests: 1% dichromate solution, three plus; 0.5%, two plus; 0.1%, one plus.†

There is evidence, therefore, that a dilution of 0.5% dichromate constitutes the aforementioned borderline concentration. Positive result with this dilution, especially if the patient has eczematous dermatitis, is not conclusive evidence of sensitization dermatitis. To avoid pitfalls in in-

*Positive patch tests were also observed (in varying percentage) with the following eczematogenic chemicals: 50% turpentine in olive oil, 5% solution of formaldehyde, tincture of iodine, 5% ammoniated mercury in petrolatum, 1% ammonium fluoride, and 1% sodium arsenate.

These positive reactions are to be attributed to the increased irritability (reactibility non-specific sensitivity) that characterizes the skin of patients with eczematous dermatitis in relation to its severity and extent. It is an expression of (a relatively new term) so-called non-specific polyvalent sensitivity that disappears soon after the acute dermatitis disappears. It is not to be confused with specific (allergic) sensitivity based on specific immunologic mechanism that usually persists for an indefinite period of time.

†ROSTENBERG and SULZBERGER (*Arch. Dermat. & Syph.*, 35:431, 1937) likewise observed 18% positive patch tests (one plus and more) with 1 to 0.5% solution of dichromate on patients with contact and non-contact dermatitis not regarded as sensitization chromate dermatitis.

Fig. 3.
Open method of patch test. A—One plus reaction to the catalyst applied over a barrier cream. B—Three plus reaction to the catalyst applied on the bare skin. C—Negative reaction to Epon resin. D—Two plus reaction to the polymer. One drop of the tested substance was employed. Similar tests on two normal persons were negative.

terpreting positive patch tests with the closed method, several dilutions of dichromate should be employed and ideally, control patch tests with the aforementioned eczematogenic chemicals: If the latter tests are negative the more valid is the significance of positive reactions to dichromate. What is more preferable is the open-method of testing. This method is more appropriate not only for dichromate, but for all substances that are inherently primary irritants.

An open patch test consists of placing on the skin a small amount of the undiluted substance to which the patient is or has been exposed; one to several drops if a liquid (Fig. 3), or a comparable small amount if not a liquid. It is allowed to dry and is left uncovered. In the case of dichromate several drops of a 1% or stronger solution are employed; in addition, a similar amount of several lower dilutions to afford information as to degree of sensitivity. Positive reactions constitute more valid evidence of sensitization than positive reactions with the same dilutions employed in the closed-method.

It is imperative to use the open-method if a high degree of sensitivity (to any substance) is suspected (reaction to fume, vapor, odor or remote contact with the allergen) in order to avoid severe reaction with the closed method or flare-up of existing or pre-existing sensitization dermatitis. Dilution of the tested substance (in the open method) should correlate its nature such as a strong irritant or its suspected degree of sensitivity, or it should be thoroughly removed from the skin after contact for 15 minutes to one hour or more. The open-method of testing is less likely to sensitize the tested person to the tested substance, yet this may occur in the case of highly allergenic substances. For example, one drop of a 10% solution (in acetone) of dinitrochlorbenzene dropped once on the skin may suffice to sensitize. It is desirable, therefore, not to perform tests, either the closed or open method, with highly allergenic substances, especially if the person is constantly exposed to the tested substance.

Chromate in Cement. Earlier writers (Schreus and Burk[11]) observed that patients with cement dermatitis had positive sensitization tests to dichromate. The source of this sensitization was unexplained until Jaeger and Pelloni[12] published their investigations on positive dichromate tests on patients suffering from cement eczema. Thirty of 32 patients had positive patch tests to 0.5% dichromate. Only 18 patients reacted to cement. They demonstrated by special chemical analyses that all varieties of cement contained minimal amounts of chromium. The concentration, however, was considerably lower than the minimum quantity required to reach the threshold of hypersensitivity which they found to be reached at an average concentration in water of 0.10% potassium dichromate.

Subsequently, a number of reports have appeared in foreign literature attributing some cases of dermatitis of cement workers to sensitization to dichromate heretofore regarded as always caused by the alkalinity of cement. Spier and Natzel[13] found 0.0025% chromium (their method of analysis is described) in two-thirds of 67 samples of cement obtained from 30 different manufacturers of cement in Germany. In some specimens of Norwegian cement, Engebrigtsen[14] found 0.010 to 0.20%. He attributes its source to the raw materials—lime and shale—used in making cement and also to its presence in steel and other alloys added to the raw materials before burning. He demonstrated that the chromium compound was soluble and not demonstrable by routine chemical analyses. He believes that the concentration of chromium salts on the skin by evaporation reaches the level required for sensitization, and that the latter is probably facilitated by induced lowered tolerance to alkali incident to exposure to cement. Of eight patients studied, all reacted positive to patch tests with 0.5% potassium dichromate, four of whom reacted also to ordinary cement. These four patients reacted negative to cement that was washed removing the chromium compound. (It is not clear to us how chrome can be washed out of cement without altering the cement itself.) He concludes that cement dermatitis has a toxic as well as an allergic pathogenesis and that the offending allergen is in all probability the water-soluble dichromate found in cement.

On the other hand, Meneghini[15] after study of 43 cases of cement dermatitis and after chemical and spectrographic examination of Italian cement, concludes that he cannot agree with the alleged theory of Jaeger and Pelloni.

The aforementioned investigations concluded that the dermatitis of some cement workers was sensitization dermatitis to chromate. This was essentially based on a positive patch test (closed method) with 0.5% solution of dichromate. As discussed in the aforegoing, we do not regard this as valid evidence.*

Epoxy Resins—Sensitization Dermatitis

SENSITIZATION dermatitis of workers formulating epoxy resins is a new industrial hazard. These resins are a new type of plastic used in coatings and in tool and dies for the aircraft, motor, and electronic industries. The catalyst or hardener of the amine type, in contrast to a non-amine catalyst, is allergenic. The use of an amine catalyst is necessary if a self-hardening epoxy formulation is to be made: a non-amine catalyst requires baking of the fabricated piece.

In our experience the amine catalysts are highly allergenic, and sensitization dermatitis is a frequent occurrence. The cutaneous reaction, predominately affecting the hands, at times the forearms, face and neck, comprises a dry, erythematous eczematous dermatitis.

The amine catalysts like many amines are primary irritants; this and its solubility only in a (non-aqueous) solvent interdicts a closed patch test with the undiluted catalyst. We have seen pronounced primary irritant action from an inadvertently performed closed patch test.

In diagnosis of sensitization dermatitis(clinical evidence may alone suffice) an open method of patch test is mandatory.

The patient shown in Fig. 3 had sensitization dermatitis. He was exposed to an amine catalyst—2,4,6, tri-(dimethylaminomethyl)-phenol (DMP-30), Epon resin, (Epon 828, Shell Chemical Company), and a polymer used to accelerate the reaction of the two former compounds. One drop of each of these substances was separately placed on his arm; the excess removed with a pledget of cotton; the residue remained on the skin. Positive results of these tests are shown in Fig. 3. Similar tests on two normal persons were negative. Another method in diagnosis is a patch test only with the finished plastic. Workers we observed who were sensitized to the catalyst also reacted to the finished plastic.

Psychogenic Aspects of Occupational Dermatoses

PSYCHODYNAMICS and psychosomatic relations in diseases have been stressed in the literature as well as psychogenic factors in occupational medicine.

There is little discussion in the literature of psychogenic aspects in diseases of the skin of the industrial worker. These aspects are discussed by Klauder[16] and by Hewitt[17] and should be of interest to the industrial physician, the industrial nurse, and the industrial psychologist.

Klauder examines the role of suggestion and fear of contagion in causing an "epidemic" of eruptions, a phobic or near panic state, and disturbance of morale. An employee with a recurring disease of the exposed skin is stigmatized, placing him in the category of a handicapped person and making unlikely employment as a food handler. Objectification of the skin and the important role it plays in the consciousness is considered in relation to the industrial worker and the "my-precious-skin" attitude of some female workers. Difficulty of interpreting sanitary and public health laws governing food handlers is discussed. In view of the influence of suggestion on other workers, and on morale in general, the industrial physician, depending upon the nature of his people, should not take too lightly the unjustified opinion of a worker that an eruption is occupational.

The report by Hewitt is difficult to abstract. He makes critical analysis of 80 cases of occupational dermatitis in relation to social, occupational and emotional factors. He believes that some cases of occupational dermatitis are largely an occupational neurosis. He advises discretion in handling persons with a cutaneous disease and caution in the use of the term "dermatitis," and suggests the possible harm of ill-considered recommendation that a man should change his job.

Under the title of "Rehabilitation in Industrial Dermatoses," Farner[18] discusses certain socioeconomic aspects of occupational dermatoses. The opinion is expressed that there is a widespread misuse of industrial insurance as a double for health and accident insurance. He refers to emotional disturbances arising out of disability as "compensationitis," "welfareitis." He pertinently writes, "Poison ivy in a vacationer does not last forever. How long should it last if acquired in line of duty and declared an occupational disease?" He proposes that physicians refer certain workers to the state Division of Vocational Rehabilitation, as, for example, those with a "highly sensitive" skin, with disfiguring dermatoses; chronic recurring skin diseases, as atopic dermatitis.

Beryllium Dermatoses

A NUMBER of reports of the toxicologic aspects of beryllium have appeared in American and foreign literature. Beryllium poisoning is now a recognized entity. Only mention need be made of acute tracheobronchitis and of acute and chronic pulmonary berylliosis.

The toxic action of beryllium and the dermatologic aspects of such are comprehensively discussed in the reports of DeNardi *et al*[19] and by

*In answer to our inquiry the Portland Cement Association referred us to the publication: HELZ, A. W., and SCRIBNER, B. F.: "Spectrographic Determination of Minor Elements in Portland Cement." *J. Research National Bureau of Standards*, 38:439, 1947. These authors report that chromium was detected by spectrograph, but not in sufficient quantities to warrant detailed study. We were, however, informed that since this study showed the presence of 0.03% of Mn_2O_3 and Na_2O it can be assumed that cement (manufactured in the United States) studied by these authors contained chromium in quantities less than 0.03%.

Curtis.[20] These authors classify berylliosis of the skin as (1) acute dermatitis, (2) beryllium ulcer, and (3) cutaneous granuloma.

Dermatitis occurs as a primary irritant action of soluble beryllium salts in sufficient concentration and also as a sensitization dermatitis. Conjunctivitis and nasopharyngitis frequently accompany dermatitis. The authors describe primary irritant dermatitis, usually confined to the exposed skin, as numerous small superficial first to second degree burns, some of which lesions develop into beryllium ulcers. Severe dermatitis is presented as moist eczematous dermatitis, especially on the hands and forearms. Sensitization dermatitis in addition to affecting exposed surfaces, frequently involved the genito-crural region and the lower extremities.

The eruption varied from diffuse papules to vesiculopapules to macules and patches of edematous dermatitis.

Hypersensitivity to beryllium was demonstrated by positive patch test with 1 or 2% solution of the soluble beryllium salts which are not irritants in that dilution.

Beryllium ulcer is an acute reaction to implantation of the crystals of the soluble salts of beryllium at site of break in the skin. Untreated ulcers may persist for months. Treatment consists of curettage of the ulcer to remove the beryllium salt inclusion.

Chronic beryllium granuloma is a subcutaneous nodule appearing one or more months after implantation of beryllium phosphor (zinc beryllium silicate) in a skin laceration or puncture produced by a broken fluorescent tube. If untreated central necrosis and surface drainage eventually develop. A curious feature is the microscopic picture of a sarcoid-like granuloma.

Surgical excision of the granuloma is generally advised. Fisher,[21] however, reports the disappearance of a small beryllium granuloma of the finger, present for five months, after application of boric acid ointment and mobilization of the finger for one month. A larger granuloma on an adjacent finger which failed to heal after the aforementioned treatment, healed after two months of treatment with 5% cortisone in oxycholesterol petrolatum applied topically.

Anthrax

PENICILLIN and other antibiotics have displaced anti-serum, arsenicals and sulfonilamide compounds in treatment of anthrax.

In Holgate and Holman's study[22] the average dose of penicillin employed in treatment of cutaneous anthrax was three million units. Other writers, however, advised as much as five million units. LaBoccetta[23] reports 36 human cases of the external type successfully treated with penicillin. The cutaneous lesions became negative in 27 or 30 bacteriologically positive cases after three days of penicillin treatment totaling 300,000 to 600,000 units.

In *in vitro* studies of Garrod[24] and of Boger[25] it was observed that Bacillus anthracis was sensitive to penicillin, aureomycin, terramycin, streptomycin, chloramphenicol and neomycin. Clarke[26] successfully treated four cases of anthrax with chloramphenicol, and Gold and Boger[27] treated eight cases, in two of which aureomycin was used; in four, chloramphenicol; and in two, terramycin.

Fig. 4.
Erysipeloid of eight days' duration in an abattoir worker who cut his thumb while working. This is the most common form of infection with Erysipelothrix rhusiopathiae in man. Pain, tense swelling, purplish-red erythema, and absence of suppuration are distinctive features.

Erysipeloid

THE cutaneous disease that Rosenbach designated erysipeloid is now known to be an infection caused by Erysipelothrix rhusiopathiae, the organism of swine erysipelas. Erysipeloid occurs at site of injury, usually the hand (Fig. 4) in abattoir workers (from infected swine), retail butchers, handlers of dead and live fish, of dressed turkeys, scrap meat collectors, fertilizer workers, farmers, veterinarians, and others handling dead animal matter or decomposing nitrogenous substances (habitat of organism). Erysipeloid results in blood stream infection and death is rare.

In Klauder and Rule's study[28] penicillin was the most effective antibiotic treatment of the experimental infection of mice. In their report it is stated that one million units and less of penicillin has been observed to be curative in treatment of the localized cutaneous form of infection in man—erysipeloid of Rosenbach. Larger doses, however, like two to three million units are advised to prevent relapse of the infection, more likely to result following smaller dosage.

Bacterial Flora of Human Skin

PILLSBURY and Kligman[29] report a critical review of the bacteriology and disinfection of the skin. Their general rules for the clinical application of their findings should be of interest to all who deal with wounds and skin lesions.

The flora of the normal skin comprises a number of aerobic and anaerobic species. Transient organisms include essentially all microbial species of staphyloccus and beta-hemolytic streptococci are not true resident organisms, but may be recovered from normal skin and may be derived from the upper respiratory tract. These pathogens grow luxuriantly on the diseased skin and are recovered from the majority of dermatitic skins, at times without clinical evidence of secondary infection.

It is not possible to sterilize the skin. Bacteria placed on normal skin die rapidly; the skin has intrinsic mechanism for self-sterilization. Interestingly, going without a bath for a week apparently does not significantly increase the bacterial population of the skin (Evans *et al*[30]).

Infection at site of injury with pathogens is not likely from resident organisms, but from external sources and foci within the body, such as nasopharynx or gastrointestinal tract. Pillsbury and Kligman advise in treatment of injuries to the skin, cleansing with soap and water and not necessarily application of antibacterial agents. They stress the importance of avoiding irritating or sensitizing medicaments (not only in treatment of injuries, but any dermatoses—*verbum sap!*) since reactions to them encourage pathogenic bacteria. There is evidence that desiccation of the skin is one phase in self-sterilization; therefore, maintenance of dryness. This is accomplished by exposure to the air (infection from air-borne contaminants is not regarded likely), avoidance of occlusive dressings, prevention of or minimization of sweating. Treat promptly first evidence of secondary infection. Of the antibiotics, they regard the combined use of bacitracin and neomycin as safe, low capacity to sensitize; a wide enough spectrum to yield satisfactory results.

Treatment of Pyodermas

THE advent of new chemotherapeutic agents and antibiotics has enhanced treatment of pyodermas (common pus-forming infections of the skin).

Sulzberger and Baer's article[31] is an excellent discussion of treatment of cutaneous pyogenic infections. They discuss 18 antibacterial agents for topical use from the following criteria: Wide spectrum of effectiveness; low allergenic potential; no or very low local primary irritancy or local systemic toxicity; not used by systemic administration in event of sensitization so that the patient is not deprived of its systemic use (to wit, penicillin); stability of preparation; acceptance to user; and not too expensive.

In accordance with these criteria they classify as excellent and good the following*: Aureomycin, bacitracin, quinolor® ointment (Squibb), sterosan (Geigy, a quinoline derivative), terramycin, vioform®[Ciba] a quinoline derivative); as fair to passing the following: streptomycin, ammoniated mercury, boric acid, Burow's solution, potassium permanganate, precipitated sulphur.

They discuss in detail the treatment of eight common pyodermas and emphasize that treatment should preserve the inherent and self-sterilizing capacity of the skin, through avoidance of allergenic or irritating medicaments causing physical or chemical change.

It is the consensus that the high incidence of sensitization to penicillin and sulfonamides precludes their use in topical therapy. An exception to a sulfonamide is sodium sulfacetamide or sodium sulamyd (Schering). This compound has long been used by ophthalmologists as an effective bacteriostatic remedy in conjunctivitis and corneal injuries.

Duemling[32] studied its antibacterial activity and its topical use in 10% in treatment of primary bacterial cutaneous infections. The drug exhibited an *in vitro* antibacterial activity against a majority of the organisms most commonly found in cutaneous pyogenic infections. It was effective in lower concentrations against both gram positive and gram negative organisms, and its spectrum compared favorably with that of a combination of bacitracin and neomycin against the organism tested. He reported favorably treatment of pyogenic infections of the skin with sodium sulfacetamide. His studies showed no evidence of irritation or sensitization. Our experience is comparable to that of Duemling.

Livingood and associates[33] report an extensive study of *in vitro* effects of neomycin, terramycin, aureomycin, and chloromycetin on strains of bacteria isolated from patients with various types of cutaneous pyogenic infections. They state that the prevailing opinion is that, in general, bacitracin is a less effective topical therapeutic agent for bacterial infections of the skin than aureomycin, terramycin, and neomycin, and that tyrothricin and gramicidin are inferior to bacitracin. Reports of clinical experience in regard to the topical use of chloramphenicol, polymyxin B, and combinations of antibiotics (tyrothricin and bacitracin, polymyxin B and bacitracin, and neomycin and gramicidin) are limited and it is not yet possible to define their status. The opinion is expressed that it is doubtful that these antibiotics and combinations of antibiotics will prove to be more effective than neomycin, aureomycin, and terramycin except that polymyxin B (especially in combination with other antibiotics) should be useful in therapeusis of Pseudomonas infections.

From their studies they conclude that if it is not possible to do *in vitro* tests, on a percentage basis for topical therapy, it would seem advisable to select (in the order named) neomycin, terramycin, aureomycin, and bacitracin for hemolytic staph. aureus infections; aureomycin, terramycin, bacitracin, and neomycin for hemolytic streptococci infections; and neomycin, terramycin, aureomycin for gram negative bacillary infections, although aureomycin is not very effective. Chloramphenicol and polymyxin B have been omitted from these selections because the experience with their topical use has been limited.

To determine the offending organism and to

*Neomycin was not available at time of study.

conduct *in vitro* tests is not practical as a routine procedure. To circumvent these tests, it is desirable to use more than one antibiotic and to change to others in the event of non-response. It is desirable, however, to do *in vitro* tests in treatment of a chronic cutaneous bacterial infection which has not responded satisfactorily after the use of more than one antibiotic.

In our experience neomycin and also terramycin can be employed topically with effectiveness and safely in most pyogenic infections of the skin.

The use of hexachlorophene (G 11 now incorporated in soap (Dial) and in some non-soap detergents, Phisoderm) is advised by Frazier and Blank[34] as an antibacterial agent since it is active against the cutaneous flora.

The rapid bactericidal action of isopropyl alcohol can be combined with the bacteriostatic action of hexachlorophene in the following formula intended for such infections as furunculosis or folliculitis: hexachlorophene 0.1 gm., cetyl alcohol 0.5 gm., isopropyl alcohol 99%, 70 cc. distilled water q.s. ad 100 cc. For oozing lesions, such as impetigo they recommend hexachlorophene ¼% in an emulsion base (an emollient of the vanishing cream base). The base could comprise a soft paste (to absorb exudation) or water-soluble ointment.

Cortisone and ACTH in Dermatology

THE status of this therapy is well summarized by O'Leary and Erickson[35] and Sulzberger.[36] O'Leary and Erickson restrict the use of cortisone and ACTH to serious or otherwise fatal conditions, such as pemphigus and lupus erythematosus; and to self-limiting hypersensitivity reactions of severe degree unresponsive to more conservative measures, such as acute urticaria, certain acute drug eruptions, acute angioneurotic edema, acute dermatitis venenata, and erythema multiforme.

We would recommend consideration of short-term courses of ACTH or cortisone as of possible benefit in treatment of severe instances of the following occupational dermatoses: angioneurotic edema, beryllium, burns, contact dermatitis, urticaria (Case 1), bites of snakes, insects and spiders.

Of the dermatoses listed by Sulzberger in which topical applications of hydrocortisone are of benefit, only one is of occupational origin, namely, contact-type allergic eczematous dermatitis. In our experience the routine use of topically applied hydrocortisone in contact dermatitis is unnecessary, indeed, not practical in consideration of the expense. We reserve its use for selected cases. The base in which hydrocortisone is incorporated is important. Emollient creams are more desirable; carbowax base is objectional if the dermatitis has a vesicular element.

In the study of Eskind *et al*[37] 79 patients with Rhus dermatitis of varying degrees of severity were treated with topical hydrocortisone or a similar appearing topical placebo. Patients treated with hydrocortisone showed no greater beneficial effect than did placebo therapy. The exceptions were four patients with severe dermatitis who showed excellent response.

Textbooks and Journals on Occupational Dermatoses

THE recent German text by Carrie[38] comprises 179 pages and 288 references. There are no photographs and no description of manufacturing processes. The first 14 pages are devoted to criteria of diagnosis. Occupational diseases of the skin are discussed under 10 main headings, such as, infections of the skin, (parasitic, pyogenic, virus), reaction to chemical and physical agents. A useful part is the list of several hundred chemical and other substances with the concentration to be used in patch tests.

We know of only a few other similar lists of concentrations available in English—the texts of Sulzberger[39] and of Urbach[40] on allergy, in Bettley's text (1949 British) on dermatology, and Schwartz.[41] The concentration given in these lists is supposed to represent that concentration to which the "normal" skin does not react. We regard many of the given concentrations as borderline. A positive patch test to these concentrations does not necessarily connote an allergic reaction. In actual use we believe it desirable to decrease these concentrations one-half.

The recent French text by Gougerot and Carteaud[42] is a more comprehensive discussion of occupational dermatoses. It comprises 348 pages, a sparing number of photographs, and many references. In Part I the dermatoses are recorded and discussion is made of the occupation concerned. Part 2 enumerates the occupations (32 main headings) and discusses the dermatoses arising therefrom. French laws relating to occupational diseases are presented. An interesting part is the listing of several hundred chemical, physical, and biologic causal agents; the cutaneous reactions they cause; and the occupations concerned.

The text by Ronchese[43] is a remarkable array, with excellent photographs, of all occupational marks (invariably on the skin, especially the hands), so-called stigmas. The text smacks of Sherlock Holmes who wrote, "The great unobservant—who could hardly tell a weaver by his tooth, or a compositor by his left thumb."[44]

The text by Schwartz, Tulipan and Peck[45] and the one by R. Prosser White[46] (now out of print) still remain the most comprehensive texts of occupational dermatoses. The text by White, despite publication in 1934, is still useful. These two texts describe manufacturing processes and their cutaneous hazards. They contain fine photographs and extensive bibliography.

Reference should be made to the two-volume "Occupation and Health" and its supplement.[47] There is considerable discussion of occupational dermatoses in these volumes (now out of print). Despite publication in 1930, 1934 and 1938, these books are an excellent source of reference.

Another source of reference is Bonnevie's[48] text on eczema in which are discussed eczematogenous noxa, many of which comprise occupa-

tional exposure. For example, there are 147 pages of discussion of metals.

There is only one journal devoted to occupational dermatoses, namely, the German publication, *Berufdermatosen*, now in its third year.

(1934 Spruce Street, Philadelphia.)

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"The Goodness of the Physician"

And if there be an opportunity of serving a stranger in financial straits, give full assistance to all such. *For where there is love of man, there is also love of the art.* For some patients, though conscious that their condition is perilous, recover their health simply through their contentment with the goodness of the physician. And it is well to superintend the sick to make them well, to care for the healthy to keep them well, but also to care for one's own self, so as to observe what is seemly."

—*Aphorisms* of Hippocrates, quote in *J.A.M.A. (Tonics and Sedatives)*, December 4, 1954.

Preparing a Cardiac for Competitive Employment

EXPERIENCES IN A CARDIAC WORK CLASSIFICATION UNIT

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SCREENING studies of the "normal" population, many conducted by industry and life insurance companies, have brought to light the interesting fact that there are great numbers of persons with heart disease (often with surprising degrees of pathology[1]) successfully employed.[2,3,4] During the recent war many American industries liberalized their physical selection criteria for employment because of manpower shortages. Experience with cardiacs was mostly favorable. It was found that the cardiac was often more efficient, held onto his job longer, and had less absenteeism than other workers.

For the most part persons who know they have an impairment of the heart want employment if they can be assured it will not harm them. Many take it without that assurance. Progressive industry is open-minded and the social-economic structure of the country has an obvious interest in productive employment of the handicapped. All alike look to medicine for technical guidance.

The Cardiac Work Classification Unit is in a sense a response to that need. Its development and organization have been well described elsewhere.[5]

It was clearly recognized when our Unit was organized at University Hospital in 1951 that there was as yet little factual knowledge upon which to select (or classify) cardiacs for employment. Not much is known about the exact effect of the various definable stresses and strains of life upon the natural course of disease. The concept of natural course[6] in relation to the study of chronic disease is fundamental, and it seemed to us that this was one of the more important remaining frontiers of clinical cardiology deserving of the research facilities of a teaching hospital center.

The present report is the first analysis of our experiences at the hospital. It covers approximately two years of exploration. We* were anxious to learn at this time whether our methods, and especially our records, will contribute eventually the information we are seeking.

Presented at the Section on Heart Disease in Industry of the Thirty Ninth Annual Meeting of the INDUSTRIAL MEDICAL ASSOCIATION, April 29, 1954, Chicago.

Methods

THE source of patient referral is an important index of the kind of human material studied. Our sources, in approximate order of frequence, were General Cardiac Clinic, University Hospital; other clinics (peripheral vascular), University Hospital; other voluntary hospitals; private and industrial physicians; State Division of Vocational Rehabilitation; State Employment Service. To the selection factors implicit in the sources of referral, we have added only two others: (1) the patient must have organic heart disease, and (2) he must have a work problem.

The Unit operated as a specialty clinic in accord with accepted ethics regulating medical consultation. We had access to earlier medical information and have tried meticulously, and as soon as possible, to supply qualified persons with a report of our findings and opinion. This aspect is worthy of emphasis because the success of a Unit is closely dependent upon patient cooperation, which in turn is greatly influenced by other medical and paramedical advisers. It is obvious that controversy and disharmony are at least as fatal an error in patient management in this field as they are in the sick room.

Work-up of an individual patient who registered in the clinic was pursued independently by the Medical Social Worker, Vocational Counselor and Cardiologist until each was satisfied with his complete command of available facts.

*A well organized unit depends heavily upon cooperative integration of many skills. These were generously supplied by the immediate staff of the Unit, which included DR. S. CHARLES FRANCO, MISS MARGARET BARRY, Vocational Counselor, and MISS ESME DAVIS, Medical Social Worker. The medical and surgical staff of University Hospital have been called upon freely. We are especially indebted to DR. JOHN SCANLON, Neuropsychiatrist, and DR. CHARLES A. POINDEXTER, Chief of the General Cardiac Clinic. The work was supported financially by the New York Heart Association and generously encouraged and advised by its Cardiacs in Industry Committee (DR. NORMAN PLUMMER, Chairman), and its Director of Community Services, MISS HELEN O'SHAUGHNESSEY.

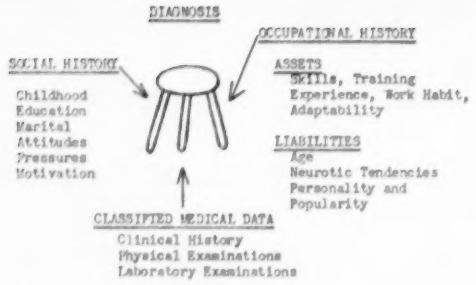

Chart 1.

A diagram which graphically summarizes the diagnostic study considered basic to any individual case study. The seat of the three-legged stool is the diagnosis which is here shown to be derived and supported by equal efforts of cardiologist, medical social worker and occupational counselor, the three "specialists" who pool their skills in a well organized Cardiac Work Classification Unit.

Data from three sources were shared and integrated to form a combined diagnostic impression. This allowed much more emphasis on environmental, social and occupational facets than otherwise would be possible. Diagnoses were highly detailed and personalized. It was soon found, for instance, that study of the cardiovascular system alone did not suffice. As will be shown, defects in other systems can often do more to obstruct successful employment than the heart disease upon which attention was primarily focused.

Our concept of a successful Work Classification Unit diagnosis may be likened to a three-legged stool (Chart 1). The seat of this stool is the diagnosis we are talking about. If it can be expected to bear the weight of a successful work prescription, it must be supported by sturdy legs.

One leg is knowledge of social environment, obtained by a developmental inquiry into family background, education, housing, and motivation. The maze of interlocking social agencies in a large city may in themselves require professional guidance.

Another leg is knowledge of vocational and avocational environment. From it came our data on individual "assets" and "liabilities" as a candidate for competitive employment.

Last but not least is the medical evaluation. In arriving at a medical opinion, we emphasized a fresh and complete restudy of each case, planned to verify and expand data supplied to us at the time of registration. We relied heavily on a detailed medical history, augmented objectively by physical examination and clinical laboratory examinations.

The cardiologist must provide medical guidance and coordination to the staff of the Unit. He is therefore well advised personally to familiarize himself to some degree with environmental factors during his direct contact with the patient.

The medical criteria for cardiac diagnosis formulated by the New York Heart Association were used.[7] The functional and therapeutic divisions of diagnosis were readily adapted to our present purposes. They formed an excellent familiar outline which was easily expanded to include as much detail as was needed for practical guidance in formulation of a work prescription.[8]

We have come to call the Work Classification Unit plan, or advice to a given patient, a "work prescription" to emphasize its therapeutic analogy to other kinds of medical treatment. Each plan evolved included a detailed definition of activity level. Thereafter any job considered possible for that patient was carefully analyzed and its physical and emotional demands compared with the recorded model.

As soon as the staff were agreed on a diagnosis and plan, the patient was informed and necessary medical reports were sent out.

What happened thereafter was part of the follow-up study to determine the patient's course. In each case there was an immediate period of varying length and difficulty during which all possible effort was expended to put the group plan into practice. This we called the Period of Implementation, to distinguish it from later more settled periods. The plan itself had to be "sold" to the patient and those around him. Various mechanisms, such as aptitude and intelligence testing, vocational counseling and training, including sheltered workshops, were used when indicated; and problems of housing and transportation met. The ultimate goal for each case was individualized in as simple and practical a way as could be. The patient was encouraged on each contact to accept and stay within his physical and emotional limitations and to develop healthful self-reliance. No job placement was considered a success if tenure depended upon employer charity. The cardiac was always encouraged to expect the same employer attitudes and to be at least as productive as an un-handicapped person on the same job.

Whenever possible, we have preferred to return patients to familiar employment and former employers. There are obvious social and economic advantages. Furthermore, it is well known that when activities are repeated often, they can be done with less energy and less emotional outlay.

Results

WE HAVE now processed 126 patients at University Hospital.

In Chart 2, we have represented the age group incidence in decades, according to the etiological diagnosis and functional classification. We found three main etiologies. The use of the term "degenerative heart disease" (red) is all inclusive. We do not of course know the true etiology of this group. Various people classify differently as arteriosclerotic heart disease, coronary sclerosis, and hypertensive cardiovascular disease. These various categories of degenerative heart disease are important to the understanding of an individual case. However, in this study, we did not separate. Approximately two-thirds in each decade had either one or more myocardial infarctions or gave evidence of coronary artery disease by a well developed angina pectoris syndrome.

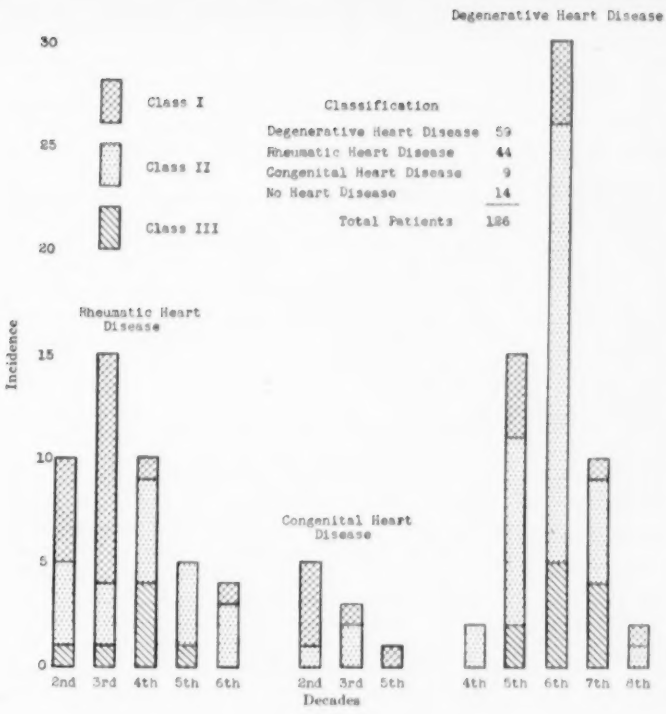

Chart 2.
One hundred twenty-six patients studied during two years at University Hospital Work Classification Unit according to age (by decade) and etiology of heart disease.

Many in the other third would, we know, also show coronary artery disease at autopsy.

Each decade was divided according to functional capacity (III on extreme left). This is the best indication of severity and of course has a direct bearing upon the difficulty in handling a given case and the result.

The case load fell chiefly within the adult ages of productive employment and the age distribution by etiology was expected. The youngest registered patient was 15, the oldest 74. We like to start working and planning with youthful patients as early as possible.

We have accepted young rheumatics from the Childrens Cardiac Clinic at Bellevue and Division of Vocational Rehabilitation as soon as medical evidence of activity is believed to have subsided. Thus far, in 44 cases we have seen only one relapse.

The increased registration of rheumatic heart disease in the lower decades is partially due to the natural incidence of the disease but it is also loaded by selective factors of case registration. It is an accepted fact that the incidence and prognosis of rheumatic heart disease are improving.[9,10] In part, this seeming improvement may be due to the fact that earlier studies[6,11] included mostly severe cases treated in late stages. Numerous cases with minimal damage and close to normal life expectancy were not included. These are the ones found on preplacement, periodic, and life insurance examinations. Prophylaxis and treatment of rheumatic fever itself have been notably improved by antibiotics, cortisone and ACTH. Modern treatment is revolutionizing our older concepts of prognosis. We can now assume that when a rheumatic fever patient reaches the age of employability with Class I or II functional capacity, he has a good chance of employability into the years of later maturity. Often but not always his functional capacity can be expected progressively to decrease. A successful vocational plan takes this into consideration.

Among our 44 patients with rheumatic heart disease, we have three individuals who have had mitral valve commissurotomy. They have each exhibited interesting psychological problems associated with reversion from Class III or IV functional capacity to I or II.

We have had only nine cases with congenital anomalies of the heart. Medical attitude toward these patients is changing rapidly. Surgical treatment is salvaging individuals who can now become productive citizens. This was illustrated by one of our patients, a young woman of 19, who has had a successful operation for tetralogy of Fallot. Such education as she has had, and that is very little indeed, has been given her by home instruction. She has an added organic handicap, bilateral deafness and speech defect from mastoiditis. Her preparation for employment must include speech training, hearing aid, cultural and trade school types of education, and, last but not least, improvement of her social attitudes.

More information is now available on the natural life history of the degenerative forms of heart disease. Well documented cases are being reported on individuals who have survived 20 and 30 years well into the age periods of normal retirement. Recently, the 20-year experience at Michael Reese Hospital in Chicago was reported.[11] The authors concluded that a patient who survived the first two months after infarction and retained Class I cardiac function has a three-to-one chance of dying of either a subsequent myocardial infarction, or some other form of vascular accident, such as a stroke. Only 17% died of congestive heart failure; 10% died of unrelated non-cardiac conditions.

Despite all precautions, 14 cases without heart disease were seen (Chart 3). Fourteen patients amount to 11%, which is fewer than others have reported.[12] Five of these (cases 9-14, inclusive) had peripheral vascular disease and were known

No Heart Disease				
	14 Patients = 11%			Iatrogenic Problem—5 Patients Diagnostic Problem—4 Patients Peripheral Vas. Dis.—4 Patients HCVD —1 Patient
1.	V.A.	F	49 Yrs.	Labile B.P.: False Angina: Obesity. Two Years Invalid.
2.	A.C.	M	30 Yrs.	Functional Heart Murmur. Alternate Periods Welfare Aid.
3.	R.M.	M	44 Yrs.	Hyperventilation Syndrome vs. Infarction. Recent. Electrician.
4.	J.C.	M	53 Yrs.	Hyperventilation Syndrome vs. Infarction eight months. Rigger.
5.	C.G.	M	35 Yrs.	Psycho-Asthenia. Heart Murmur. Welfare Aid.
6.	V.W.	F	19 Yrs.	Functional Heart Murmur. Claim for Easier Job.
7.	S.K.	M	22 Yrs.	Functional Heart Murmur. IMD Referral. Early Delinquency Record.
8.	K.W.	M	44 Yrs.	Heat Prostration. Pipefitter. Three Months Medical Leave. IMD Referral.
9.	J.D.	M	53 Yrs.	Idiopathic Acute Pericarditis. Medical Leave Six Weeks, Pensioned.
10.	C.R.	M	38 Yrs.	T.A.O. Both Hands. Puerto Rican. Six Months Training. Language.
11.	W.K.	M	70 Yrs.	A.S.O. Lowers. Senility. Longshoreman.
12.	J.P.	M	61 Yrs.	A.S.O. Lowers. Amputation. Illiterate Italian Laborer.
13.	J.H.	M	51 Yrs.	A.S.O. Lowers. Roofer. Electrician Seasonal.
14.	H.N.	M	22 Yrs.	HCVD. Paranoid Psychopath. Aptitude Testing Refused.

Chart 3.

A list of patients without organic heart disease with brief description which was amplified in the text. The kinds of differential errors in diagnosis in the first nine cases listed from above downward illustrate some of the mechanisms leading to so-called iatrogenic heart disease. The remaining five below were admitted as circulatory problems with cardiac complications from the Peripheral Vascular and Hypertension Clinics of University Hospital, respectively. The inclusion of nine cases out of 126 studied illustrates the importance of careful restudy in the Unit. Each patient was believed on acceptable medical authority to have heart disease when registered. An error in diagnosis need not necessarily create a cardiac neurosis, and had not in four of these instances.

to have no cardiac complication when admitted.

The first case (Chart 3) was an excellent illustration of iatrogenic heart disease. She had a markedly labile blood pressure with false angina and no cardiac enlargement or other sign of vascular disease. She had nurtured her fancied illness for over two years with medical compliance and had found it so useful a weapon on her husband and his mother that although she is back working, she is still reluctant to give it up entirely. The psychiatrist was very helpful.

Diagnostic errors do not need to lead to iatrogenic disability and, in four cases, apparently had not yet done so.

In reviewing our experience in cardiac work classification, we decided we would like to know something about success and failure. The line dividing success from failure is not always clear cut or final. What we have to report now is not the final story. Progress toward an ultimate goal has often been slow and irregular, and is never finished while the case remains active.

Our present criterion for success in a given case is whether we have made a positive contribution toward a productive normal life. Job placement is not an end in itself and is not the sole criterion for success. If, as has happened in our experience, a cardiac ignores medical advice and continues employment or other environmental conditions which we believe bad for him, we count it a failure. An individual who applies himself to a course of training which will clearly lead to well paid employment with low stress demands was a success.

In Chart 4 we show a synopsis of our "success" to date. Some of these people were working; some were not; a few were dead. For our total group of 112 patients with cardiac disease, we rated ourselves slightly better than 55% successful. The experience varied somewhat in different decades. In general it tended to decrease in the later age groups. Some of the reasons for this will be more apparent shortly when we examine our failures.

Mechanisms of implementation found successful in the different age groups were of interest. None of our patients under 20 had any employable skills or much idea of how he wanted to earn a living. Natural inclinations were solicited and balanced with aptitude testing and training calculated to make maximum use of each individual's capacity and resources.

As an individual matures, his aptitudes tend to declare themselves and formal testing was less necessary. Aptitude testing was used in only one individual over age 40. Need for formal training indicates a rather radical change of employment. We avoided this as much as possible, particularly

Study of Successful Implementation (By Age Group)
SECOND DECADE (10 Patients = 67%)
Aptitude Test and Training—10 Patients (100%) (5 months-4 Years)
THIRD DECADE (10 Patients = 56%)
Aptitude Test and Training—7 Patients (70%) (8-12 Months; One Longer)
Submitted Plan Approved—3 Patients
FOURTH DECADE (7 Patients = 67%)
Aptitude Test and Training—2 Patients (30%) (2 Months-2½ Years)
Training (without testing)—2 Patients (2-10 Months)
Sheltered Workshop—1 Patient (3 Months)
Classification Reassignment—2 Patients
FIFTH DECADE (12 Patients = 57%)
Training—3 Patients (2-6 Months)
Classification Placement—3 Patients
Classification Return—5 Patients
Classification Sheltered Return—1 Patient (2 Months)
SIXTH DECADE (15 Patients = 44%)
Aptitude Test and Training—1 Patient (2 Months)
Sheltered Workshop—2 Patients
Classification Reassignment—6 Patients
Classification Return—5 Patients
Training—1 Patient (7 Weeks)
SEVENTH AND EIGHTH DECADES (7 Patients = 44%)
Classification Return—4 Patients
Classification Reassignment—3 Patients

Chart 4.

After diagnosis and formulation of a "work prescription" it may take time and variable degrees and kinds of effort to implement the plan. Useful mechanisms were here summarized for each age group. The objective with each patient was to utilize his skills to find and hold on his own merit a job in competitive industry which will be within his physical capacities.

in older individuals. A complete change of occupation was effected sometimes without formal retraining. The sheltered workshop can be employed with benefit in many cases who have been unemployed for long periods or have lost self-confidence as a result of illness. Only large cities have well established sheltered workshops staffed with doctors and nurses, but this need not interfere. It is possible to improvise. This was illustrated by the case of a dentist sent to us recently. He was a man of 56 with minimal mitral stenosis (Class I) who, one month after the onset of auricular fibrillation over three years ago, developed left hemiplegia. He had fine medical care followed by excellent supervision in one of our best neurological centers. He retained his mental faculties and recovered full use of his left leg and all but about 10% of his left hand. He was right-handed. There was no obvious reason why he could not do most of the procedures of dentistry, yet he remained unemployed. We solved his difficulty by enlisting the interest of the Dean of the dental school from which he graduated many years ago. The Dean successfully simulated sheltered workshop conditions in the teaching clinic. Our patient rapidly regained confidence and reopened his private dental office.

In the sixth, seventh and eighth decades, our success experience fell below 50% (Chart 4), and, while numbers involved are possibly too small for final decision, it seems reasonable to say at this point that cases registered at these ages could be more carefully screened from the point of view of employability based upon criteria other than their disease.

Unfortunately, many individuals in all decades may show a defective attitude regarding their disease. Employers cannot be expected to employ a handicapped person because of his disease. Further, cardiacs do not have crutches or wheel chairs visibly to dramatize their handicap.

In Chart 5 we list our "failures." There were 50 patients, or over 45% of 112 cardiacs. At the bottom of the chart we show the total percentage of failure in each group and the figures to the right indicate the number of cases in each decade where failure was attributed to the cause or condition listed on the left.

Non-cardiac disability was our greatest difficulty, and neuropsychiatric disorder was far in the lead.

Other non-cardiac disability has included deafness, hemiplegia, shoulder-hand syndrome, skin diseases. None of these was listed because in each the added handicap was successfully surmounted except for partial blindness in one woman needle worker aged 65.

In contrast to our unfavorable neuropsychiatric experience, unsurmountable cardiac disability was one-third as important. Three individuals, on the basis of our study, were considered too ill to work at all and advised not to seek employment. Two are known to have died of their disease within the year, and the third is believed to be dead although we have not been able to verify this. A fourth patient came to us before

ANALYSIS OF FAILURES
(50 Patients = 45.6%)

		Age by Decade—Number of Patients						
		2nd	3rd	4th	5th	6th	7th	8th
Non-Cardiac Disability (10 Patients = 38%)	Psychopathy	1	1					
	Personality Defect Irresponsible (Alcohol)	1				2		
Neuro-Psychiatric Disability (18 Patients = 36%)	Cardiac Alibi		1		1			
	Paranoid Trends				1	3		
	Mental Deterioration					1		
	Alcohol					1		
	Job Prestige					1		
	Anxiety Neurosis				2	2		
	Visual Defect						1	
Cardiac Disability (6 Patients = 12%)	Unemployable—2 Died			2	1			
	Deferred for Rheumatic Fever Activity	1						
	Myocardial Infarction not Stabilized—Died					1		
W.C.U. Guidance (15 Patients = 30%) (7 Patients Working)	Employee Refused Reclassification		4			1		
	Reclassification Refused by W.C.U.		1		1			
	Medical Certification Withheld			1	1			
	Family Apprehension	2				1		
	LMD Apprehension				1	1		
	Employer Apprehension				1			
Economic Motivation (6 Patients = 12%)	Alternate Acceptable Private Source					2	1	
	Public Welfare Aid		1	1				1
Job Placement (4 Patients = 8%)	Low Skill Reduced Cardiac Function					1	2	
	Union Seniority Rules					1		
Percentage of Failure by Decade		33	44	33	43	56	41	41

Chart 5.

An analysis of what were considered unsuccessful were classified according to the estimated dominant block. Neuropsychological difficulty leads all other causes for failure, illustrating that reaction to disease may be more important than the disease. Cardiac disability was the second largest group, includes patients believed to be too ill or with too brief life expectancy for any form of employment.

he was fully convalesced from his first myocardial infarction; he died of a second one between the time we examined him and the date set for his return to the clinic. A fifth died after his first visit to the clinic before his diagnosis and classification were completed. On data available, we believe he was unemployable.

The second largest cause of failure after non-cardiac disability was non-acceptance of Work Classification Unit guidance; in other words, we failed to sell our ideas to these individuals. Seven of them are now working; five at their former jobs which we believe are considerably less than optimum. Two others were refused reclassification and withdrew when refused expensive courses of training for positions beyond their abilities.

An occasional patient "shops" medically until he gets the "right kind" of medical certificate. We have two of those, one of whom insisted on going back to work as a rigger, the other to heavy trucking.

Sometimes family anxieties were so acute that members of the group insisted on supporting an employable cardiac. They believed that the patient would live longer, or there were other sociological reasons.

Sometimes our advice did not coincide with that of the private physician.

In only one instance have we listed employer apprehension as a cause for failure. This case illustrates another complication that can arise when doctors become over-protective. This woman was 43 years of age. She had a long standing mitral stenosis which had not prevented one normal pregnancy and delivery; also, she had worked 24 years as a clerk in the office of a large company. One morning in December, 1952, she awoke to find numbness and coldness of her left foot. She went to work and reported to the industrial physician. He immediately recognized that one of her peripheral arteries had been occluded by embolus and sent her to one of our hospital associates interested in peripheral vascular diseases. After two or three weeks on anticoagulants in an oscillating bed, she made an excellent local circulatory recovery and should have gone back to work. Unfortunately, she was entitled to nine months accrued medical benefits, so her physician prescribed nine months of rest and sent in the required certificates of disability. In September, 1953, when the nine months were over, her employer refused to believe she had recovered enough to come back to work. Thus, despite her exceptional work record and her loyalty to company associates, she lost her job. Thus far, certificates from the private physician and from us have not persuaded the employer to change his mind. This woman is married and does not need the money but she has always worked and is finding it difficult to adjust to inactivity. We think she should work and will be easy to place if she decides to try a different employer.

Sometimes an individual takes ill and discovers that his wife or children are able and willing to support him. The chronic illness salves a not overly robust self-respect and he continues on without work indefinitely. We have seen the same reaction to various forms of public welfare aid. The incidence in our series was smaller than it might be in a charity hospital clinic. One of these individuals, for instance, was an unskilled laborer with seven children and a wife. He could never hope to command a job which would match his family income under City relief.

The small size of the last group in Chart 5 is of special interest and a tribute to the efficiency of our vocational counselor. There were only three patients with whom there was a flat dead-end failure to find employment because of a combination of low-level skills plus low-level cardiac function (all Class II). Two were piano movers; the third had done the hardest kind of outdoor manual labor all his life. One was a completely illiterate native-born American; another had a foreign language difficulty, and in all three we have not been able yet to figure out anything that they could do for which anyone would be willing to pay them a living wage.

Chart 6 lists our mortality figures. There were 10 patients who died, which is 8%; if, as seems fair, we included only those who were originally considered employable, the number was reduced to under 5%.

The first two need no comment. They were unemployable. The third died after his first clinic visit before diagnosis was completed. The fourth was not classified pending completion of convalescence—he died of a second infarction.

Nos. 5 and 6 (Chart 6) seem to act as mutual controls for each other and illustrate basic concept of natural disease course. The primary problem in each individual was cerebral arterial disease. In each, the cardiac impairment was less severe than the cerebral. Each had had a cerebral accident—six months and a year earlier, respectively. No. 5 was a self-employed bootblack. No. 6 was a pharmacist. The bootblack followed our advice, overcoming family and private physician opposition, and went back to his job which was modified in a number of ways to reduce stress and strain. He rapidly became happy and contented, but he died a year later of a second stroke. The pharmacist had some residual hemiplegia. His blood pressure levels and signs of vascular deterioration were more marked than were those of the bootblack. He was offered a job in a small non-commercial pharmacy where he could do ac-

DEATHS

Total Incidence—10 Patients (of 126—8%)
Incidence Among Employable—6 Patients (of 126—5%)

1.	J.L.	M	44 Yrs.	HCVD. Severe EH. Angina Pectoris. One and three-fourths Years Debility. 111D Unemployable.
2.	I.M.	M	39 Yrs.	RHD. Inactive EH. AS.AI.AF. CHF Five Months. 111D Unemployable.
3.	J.W.	M	58 Yrs.	ASHD. AI. RST. 111? Classification Incomplete.
4.	J.I.	M	51 Yrs.	ASH. Post-Infarction Four Months Angina Pectoris Not Stabilized. 111D (Temporary). Second Infarction.
5.	J.S.	M	57 Yrs.	HCVD. LVH. CVA. Six Months. Worked One Year. Died CVA.
6.	L.Z	M	56 Yrs.	HCVD. LVH. CVA. One Year Left Hemiplegia. Anxiety. Brief Work Trial. Died CVA. One Year.
7.	I.A.	M	26 Yrs.	RHD. Inactive. EH.AI.MI-MS.AF. 111C. Train Drafting. Sudden Death One Year.
8.	J.M.	M	31 Yrs.	RHD. Inactive. EH.AI. SBE (Cured). 111C. Train Clerk Eight Months. Sudden Death Six Months on Job.
9.	W.G.	M	39 Yrs.	EH.AS.-AI. RSR. Angina Pectoris. 11C. Worked Two Years. Died Second Attack CHF.
10.	C.R.	M	39 Yrs.	ASHD. Post-Infarction One and a half Years. IB. Drove Taxi Against Advice. Second Infarction in Bed. Died in Hospital.

Chart 6.
A summary of the deaths that have occurred among all registered patients, both employable and unemployable.

customed work at his own pace. He refused. He too died a year later of a second stroke.

No. 7 was a promising young man of 26 with rheumatic heart disease who died a year after he was first seen. The year had been spent learning to be a draftsman. There was no sign of deterioration during this year but he died suddenly, just before starting on his first job.

No. 8 is the only one thus far who has actually died while on the job premises. He also died suddenly without warning. He had completed 14 months of successful experience since we first saw him. He had a free aortic insufficiency and had been treated successfully for subacute bacterial endocarditis. Unfortunately, we do not have an autopsy.

No. 9 is a failure in medical supervision. He was one of our first clients, a skilled artisan who enjoyed his work and came to the clinic only to please his wife. As an old and valued employee, it was possible to arrange minor modifications in his job to suit his functional capacity. He worked over two years but we were never able to get him back to the clinic. He was admitted to University Hospital twice for congestive heart failure before he died. He might or might not have done better if he had submitted to medical supervision.

No. 10 is an example, among other things, of the inaccuracy of prognosis in an individual case. This taxi driver did not follow our advice so I suspect we do not need take any responsibility for his death. However, we frankly did not anticipate an early death. He came to us with a documented record of a posterior wall infarction one and a half years earlier. When we saw him, he had a normal electrocardiogram, normal blood pressure, no cardiac enlargement, and normal vascular findings. He was able to engage in strenuous levels of activity without symptoms, and his double Masters test was negative. Nevertheless, approximately two months later he had a second more severe myocardial infarction with onset in bed at home and death a few days later in the hospital.

Conclusion

THERE are certain obvious lessons to be learned from our relatively brief experience in operating a Work Classification Unit.

We believe the chief principle in such a Unit is its emphasis on the patient as an individual who merits a careful and complete study as a whole. This concept has rather gone out of date in this age of specialization. We have to re-learn well known facts; high on the list, that one must treat an individual person and not his disease.

The Work Classification Unit staff might perhaps be defined as a product of our own generation of specialization. It is a gathering together of specialists who pool their combined skills to find an answer to each patient's problem. The same end can be, and is, daily accomplished by physicians in private practice and by those employed in industry. The physician in industry is in a highly favored position and can with benefit familiarize himself with the simple techniques involved. If he does not wish to assume the entire responsibility, the nearest Work Classification Unit should recommend itself to him as a specially qualified source of impartial advice.

In our experience, increasing severity of heart disease as measured by lowered functional capacity may make the individual problem more difficult to solve but it does not, other things being equal, block a favorable result as often as expected. The cause of failure was rarely heart disease; was instead a factor which would probably have made the same individual unemployable without his heart disease.

We believe but cannot prove that persons with heart disease under optimum medical management can work safely. Perhaps work has not the universally baleful effect most people, medical as well as non-professional, assume. If one follows workmen's compensation reports of cardiac awards, this assumption looms very large indeed. Recently, epidemiological reports by Morris *et al*,[13] on the incidence and severity of heart disease among large numbers of transport workers, civil servants and postal workers in England came to a refreshingly revolutionary conclusion. They found that physical workers had less heart disease and heart disease of less severity than desk workers.

The Morris reports are not conclusive, as the authors clearly recognized. Physical expenditure is only one factor, and what happens outside of working hours we believe has at least as important an influence upon the natural course of the disease as what happens during the eight hours on the job.

Even the physical expenditures involved in daily life are difficult to estimate quantitatively. The cardiologist must depend heavily on sound clinical judgment, and we see no likely substitute on the medical horizon.

We believe the Work Classification Units are a useful mechanism for research and that if careful records and follow-up studies are coordinated, we may sometime know more about the ambulatory phases of heart disease and how to advise its management. When this happens and this knowledge becomes part of every cardiologist's advice to his patient, and to industrial physicians, the Work Classification Unit can disband.

(102 Maiden Lane.)

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The Man and the Myth

A DOCTOR ILL? To most of us such news comes as a shock. It reveals what we all know but are reluctant to accept: that the doctor, too, is mortal. And because, in our frailty, we seek a shield against disease and death, we glorify the doctor, invest him with impossible power. Ironically, this legend obscures the basic fact that the doctor is a man who must earn his daily bread. What is the true picture of the doctor in our society?—a man of hope . . . . a man dedicated to easing human suffering? Yes! Yet he is more. *The doctor is an economic unit. He is a man who must compete in the marketplace for business, as we all do, whether we deal in pills or pants.* This does not diminish the stature of the doctor. On the contrary, it releases him from the awful burden of saintliness. It establishes him as a man. Wake him at four in the morning. He is sleepy. Call him from his meals. He is hungry. Summon him from his family. He is lonely. Subject to the laws of biology, he is equally subject to the laws of economics. *The doctor works for a living.* Everyone agrees the doctor is no philanthropist. Nobody expects medical care without paying for it. Yet it would astound us (and the doctors themselves) if we were to tote up the bill the nation's patients owe their doctors and compare it with the bill owed their tailors. Even more outstanding would be the number of hours doctors spend in clinics, hospitals, on calls, for which they receive no payment nor expect any. The doctor deserves no medal for this. But these unpaid bills and freely given hours can be translated into lost income . . . . income it would be unseemly for the doctor to insist upon. The legend of the doctor prevents him. This incongruous situation becomes even sharper when viewed against the accepted business practices in other fields. Do bankers offer their specialized knowledge and time without expectation of payment? Do lawyers? Brokers? Accountants? We don't expect them to, nor do we think a businessman foolish who did not seek every profit to which he is entitled. The doctor cannot. There is his legend to be appeased. It is nothing for a giant to do gigantic things. It is within his nature to do so. But it is something when a man transcends his mortality. And this is the secret of the doctor's stature. As a mere man he must rise above his limitations. *This is the American doctor—a man greater than his myth.*

—Advertisement published in *Newsweek* (October 25, 1954, p. 99) by Key Corporation (pharmaceuticals), Miami, Florida.

Asthma in Industry

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WHEN faced with a case of bronchial asthma, the physician in industry fully must realize that his working patient differs from a non-working individual because he "lives" in at least two sets of environments, namely, the physical and mental surroundings of his job, and as well, of his home. Although he will rarely blame his home life for what happens at work, the employee will often blame whatever happens to him almost anywhere, on his work or working conditions. Routine skin tests and injection treatment are no solution to the patient's problem, as is attested by the fact that he so often seeks further help from the specialized private physician. There is no real reason why either the full-time or part-time plant physician cannot do as well.

Asthmatic working patients can be grouped into a number of categories. There are those few in whom, somatically, the working conditions are primary causes of wheezing, and others in whom they may act as secondary causes. Thirdly, they may non-specifically aggravate coexisting asthma. Fourthly, the working conditions may be not at all related, although the patient wheezes "on the job." Occasionally, psychogenic factors present in the industrial environment, and not necessarily elsewhere, may precipitate attacks in bronchospastically conditioned subjects. Although industry is not generally alert to these particular stress situations, they must nevertheless be considered in any discussion of asthma.

Each type of asthma, when present in the uncomplicated syndrome, is easily delineated and recognized.

In some industries, as in the handling, among other things, of raw and semi-finished wool, cotton, kapok, furs, and cereal grains, the worker is exposed to the primary allergens, and, as well, to the molds, smuts and rusts which may be present in such crude materials. Although these same primary allergens may be present in some finished form in the worker's home environment, as, for instance, in blankets, or cotton- or kapok-stuffed bedding, nevertheless there is usually no doubt as to the magnitude of the respective exposures. When the primary allergen is present only at work, as with castor bean or gum acacia, there is no doubt whatsoever that it is the direct cause of disability.

We have seen a number of such patients, including longshoremen, truck drivers, workers in mattress factories, furniture factories, woolen mills and pharmaceutical manufactories, who prove how wide the range of such exposure may be. The causative allergenic agents are well known in the respective industries, and air cleaning methods usually go beyond removing the allergen, and actually provide excellent working conditions. Occasionally, however, an exquisitely sensitive patient may continue to react to minute exposure or, as we recently experienced, a breakdown of the air conditioning apparatus may cause a "minor epidemic" of wheezing.

The allergens present at the job may, under special circumstances, act as secondary causes of bronchospasm. The patient may, for instance, be moderately sensitive to ragweed pollen, enough only to give him mild seasonal symptoms; or else he may be allergic to feathers, causing mild perennial difficulty. When work entails exposure to other inhalants, these may not affect the patient sufficiently to cause extra-seasonal symptoms, but yet enough, acting cumulatively, to intensify asthma during the pollen season. Similarly, the dander-sensitive patients may be mildly ill at home, but truly sick at work. They often present a particular pattern of response. They wheeze for the first hour or two at work, and then again for the first hour or two after returning home, because of the overlapping exposures. With the removal of either allergen, the wheezing recedes to sub-clinical levels.

As a case in point, we have, in the recent past, conferred with management and workers concerning the medical-legal aspects involved in patients normally *pollen* sensitive, but incapacitated by exposure to other allergens while at work. For the first attack of this nature occurring at work, the employee immediately concludes that the working environment is the cause of his symptoms. The cessation of the asthma after the pollen season is over, is not always accepted gracefully as proof of other causative relationships. Compensation payments limited to the period of disability, have been a satisfactory temporary solution. The problem always causes heated discussion, and occasional suits, and yet need never arise if patients with a history of seasonal inhalant sensitivity are given work where they will not be exposed to large amounts of other inhalant allergens. The brighter side of the picture is seen when the patient sensitive to pollen is completely free of wheezing while at work in an air-conditioned factory.

"Non-specific aggravation" is the term applied to the effects of gases, odors or fumes present at work, and capable of causing bronchospasm. These may be primary irritants, present in unusually great quantity, very often during blower-system breakdowns. One of our patients who worked with antibiotics had asthma with bronchospasm for two months following such exposure to the solvent used. The fumes involved are also well known in the industry, and the immediate sequence following the temporary exposure and the relief following the initiation of precautionary measures, make the diagnosis certain. A list of the fumes known to cause such asthma is available.[1] These non-specific aggravating factors are not usually toxic, but rather cause cough and wheezing following non-passive (i.e., forced) expiration. Here, too, we must be concerned with whether the aggravation is of the moment, has initiated a cycle of illness which will last some months, or whether it will have longer lasting effects requiring prolonged compensation periods, especially in the older patients approaching the age of compulsory retirement.

Completely non-related causes obvious to the plant physician may not be as clear to the worker, who may not be trained in the logical niceties of cause and effect. Exposure *to* pollen on the way to work may result in symptoms while *at* work. The patient will not only almost always blame the working conditions, but also triumphantly prove this supposed relationship by demonstrating almost complete freedom from symptoms on the days he does not go to work. On one occasion, for a patient who worked in a textile mill, we had to prove to him that taking the same trip through the same ragweed-infested back lots, but without going into the factory, resulted in a quantitatively similar degree of bronchospasm which, in any case, ceased after the first widespread rains following the first good killing frost, which ended the active ragweed pollination season.

PSYCHOGENIC factors "on the job" affecting allergic patients must be given some consideration. They differ in no way from those which result in spastic disorders, not necessarily or invariably directly psychogenically induced. Among these may be listed: occipital headache, back pain, anginal symptoms, and the disorders associated with abdominal or pelvic "cramps." The cause may vary from ordinary boredom to the severe psychological stress due to inability to maintain production levels, especially in those industries in which "piece work" still obtains. We have noted such difficulties as due to failure of interpersonal relationships, including simple rivalry, and sometimes non-acceptance by the group of an individual, because of religious and color differences, and rarely, if suspected, of sexual deviation. One of our patients suffered severe exacerbations of an otherwise proved feather sensitivity, under good control, but due, on this occasion, to a continuous "needling" by bullying fellow workers who suspected him of homosexual tendencies. Another patient was asthmatic when the daughter of the president of the firm was given a vacation job, and because of social position, enjoyed privileges denied the permanent, and, of course, more senior worker. In present-day industry, the offended workers cannot always be reached, either by the physician or by management, and the employee's training costs and talents are lost to a job in which there is a happier emotional climate..

So far, the stressors at work have been discussed as though they represented only one more environment. If, for the moment, we disregard the rare patient with food allergy who cannot (if wheat sensitive) carry sandwiches to work or eat at plant cafeterias, and think, rather, only in terms of inhalant allergy, we see that this is only superficially true. The complete picture is recognized only when we realize that the patient is exposed to inhalant allergens at home, en route to and from, and, as well, on the job. He may be equally exposed to secondary allergic and nonspecifically aggravating factors in all three environments. If male, he may be a heavy cigarette smoker; if female, regularly occurring intercurrent factors may influence the patient's clinical course. In any environment, any patient can be psychogenically affected. Granting the knowledge of these effects, there are problems which remain to be solved, because we have only discussed typically allergic, i.e., atopic, patients. The issues are not so simply resolved, because not all patients who wheeze are necessarily allergic.

The differential diagnosis must, whenever possible, rule out other bronchospastic disorders which may, at times, congruently be present. We have elsewhere[2] made a tentative qualitative and quantitative classification of the asthmas. In pure form, these may be listed as atopic, infectious (a) acute; (b) chronic; psychogenic, physical, nasogenic (reflex); cardiac, locally obstructive, and lastly, as due to drug reactions.

In a typical wheezing patient, the general type of asthma involved is often easily recognized. If the patient actually recalls the pertinent facts, and is truthful, and not exclusively compensation-minded, the personal history of atopic eczema, or of food sensitivity in infancy; of later nasal allergy; of subsequent seasonal or environmental allergic tracheitis leading to a cough and wheeze, is strong presumptive evidence of the atopic type of sensitivity. We have found that printed questionnaires, filled out before the first visit, and by the patient himself, will save much subsequent obfuscating discussion. The questionnaires not only save time, but also serve as a basis for a complete history and environmental survey.[3] If there is a family history of these same disorders, which many patients will at first deny, the evidence for true atopy is strengthened. A personal history of previous environmental or seasonal symptoms, exacerbated by abrupt barometric or temperature change, affected by fumes or odors, and made

worse by nervous tension, fatigue, hearty laughter and exertion, will all point up the diagnosis. If there are sensitivities to foods or to inhalants, known to the patient or previously proved by trustworthy studies, there is no doubt that a true case of bronchial asthma of the atopic type is present.

FEW of these patients present other complaints. A physical examination proves the mucous membranes pale and translucent, with the sinuses clear or the membranes symmetrically thickened. In early cases, the pulmonary wheezing changes in pitch and intensity from area to area. The total vital capacity is reduced, and the amount expired in three seconds markedly so. Between attacks, however, there are no pathological findings, since the disorder is completely reversible, especially in its early stages. At this time pulmonary function studies may demonstrate a normal lung. The laboratory data prove the mucoid secretions to be rich in eosinophil cells. The blood is normal. There may be a blood stream eosinophilia. In such patients, skin tests give multiple positive reactions. The response to treatment is excellent with epinephrine, ephedrine, aminophylline, and their derivatives, and to the steroid hormones. The wheezing is intermittently affected by exposure to, and elimination of, the causative allergen. Such patients respond well to both elimination and to specific injection therapy.

The skin tests, although they represent a small and corroborative part, rather than a complete diagnostic procedure, may lead to the discovery of previously unsuspected collateral causes. Coupled with inhalation tests and pulmonary function studies, inhalants, if present in the plant, can quickly be ruled in or out of the picture.

As an example, on one occasion eight men, working in a nearby woolen factory at a time when layoffs were occurring, all complained of asthma following the handling of bales of wool. Test solutions to 30 types of wool proved Uruguayan wool to be the most specifically allergenic of those being handled. The asthma had occurred, however, at the peak of the ragweed pollen season. Several workers had a history of asthma in previous Septembers, and several were taking specific pollen extract injection treatment from a local physician. Their pollen symptoms might have been aggravated by the wool, but it was unlikely. Those in whom the wool sensitivity was greater, and the remaining inhalant sensitivities less, were placed into other categories of asthma, although all complained of wheezing occurring at the same time, in the same environment, when handling a single allergenic raw material. Suits were initiated in succession by the men, so that each might benefit by the other's experience. The proof that the plaintiff, in the first suit, was sensitive to pollen and had taken treatment, led to a dismissal. The others quickly settled for compensation limited to the period not worked. We have seen similar situations occur with longshoremen handling raw coffee, castor bean, hemp and jute, among other potent allergens.

The patient with wheezing associated with acute infection of the upper and lower respiratory tract, suffers from what the older texts often labelled as "asthmatic bronchitis." This can be superimposed upon a typical allergy in an atopic patient. Each may intensify the other. The infection may become chronic, the infectious element then overshadowing the allergy. The presence of an infection may knock the patient off his "physiological balance," so that the primary asthma, ordinarily under control, now becomes manifest. On the other hand, the additional mucus covering the respiratory tract certainly dissolves allergens more easily, and the hyperemic tissue absorbs them more rapidly. The acute infection has, in such cases, made the atopic patient respond as though overwhelmingly exposed to his allergens. Obversely, such patients, because of the often uncontrolled allergic response of the mucous membrane, reacting abnormally as regards their general physiology, are often, from a clinical point of view, easily infected. Allergy to bacteria alone may complicate the picture. It is in this group that the administration of antihistaminic agents appears to lessen, or perhaps "cure" the so-called "cold." The patient, however, is not truly being cured, and the disorder is not really a cold. Such patients respond very well to antibiotic medications combined with Cortisone and ACTH.

The non-atopic patient, who wheezes with acute pulmonary infection, rarely presents a history of previous atopy, and rarely a history of familial allergy. The onset of the wheezing is usually gradual, but may be abrupt. The clinical course is not predictable, excepting as the disorder reoccurs with successive infections. The physical examination shows the typical red mucous membranes, with opaque sinuses, often unilaterally affected. The secretions are purulent; the white cell count and sedimentation rate are both elevated; and the skin tests are negative, or nonspecifically mildly positive. The response to treatment is poor or transient for epinephrine, ephedrine and aminophylline. The response to vaccine therapy is not consistent.

The chronically infected asthmatic patient may truly represent a chronic infection, or again may present an infection superimposed on his inhalant allergy. He may be suffering from frequent acute infections, discontinuously chronic in time, rather than continuously chronically present. These may become the truly asthmatic bronchitis patients. With them, too, the personal and family histories may be negative for allergy. The onset of the wheezing may be gradual, with a history of chronic infection, and increasing dyspnea following exposure to pulmonary irritants, bacterial, gaseous, chemical, or non-allergenically particulate. The exacerbations successively increase in severity and duration. The lungs are emphysematous, with diminished cardiac dullness, diminished breath sounds, low diaphragms, with both lowered vital capacity and prolonged expiration time. With these patients the pulmonary function studies, when tests are

done in succession, show exactly the same amount of air expired for the same time in seconds for each test. In the truly allergic patient, the forced expirations for each test lead to lower and lower readings as the tests are repeated. In the chronically infected patient, the accessory respiratory musculature is prominent. The blood may be normal, and show no increase in sedimentation rate. The skin tests are usually negative. The response to treatment is good with antibiotic agents, at least temporarily, depending on the presence of bronchitis, emphysema, bronchiectasis, or pneumoconiosis. On the other hand, the patient is very often relieved by physical measures, postural drainage, belts, and climatic change.

Some such patients may appear to be allergic because of the seasonal incidence of their disorder, which often begins in the fall and lasts until early spring. With successive annual involvement of the lung, the symptoms occur earlier each autumn and last later into each summer, until the period of, at first complete, and later partial, remission, is limited only to the summer months, and then, perhaps, to a few weeks in July and early August. In smokers, cigarettes are usually, and often with some validity, one of the chief aggravating causes. Elimination of pulmonary mucous membrane irritation, ranging from tobacco smoke to range oil, will ameliorate, but not completely clear the symptoms. The pneumoconiotic patients, especially those with long histories of exposure to silica, anthracite and asbestos, require specialized study and treatment not of the usual anti-allergic or anti-infectious type. The job, however, may be incriminated in outside workers, as truck drivers, post office employees, bill posters, gas station attendants, and those in similar occupations, in which the patient is exposed to abrupt changes of temperature and weather. The classic concomitant circumstances for ease of pulmonary infection are then present as precipitating factors.

THE WORKER whose bronchospasm is chiefly psychogenic in origin presents any one of a number of psychological syndromes. If, of all the types, we describe only the "hysterical," the following criteria are valid. There may be a personal history positive for atopy, but the present attack is apparently not related to exposure, environment or season. There may be a family history of allergy in those patients who present what is termed "imitative asthma." The onset of wheezing is abrupt, during and following emotional stress. The clinical course depends upon the continuation of the stress, the strain, or the neurotic purpose of the attack. Such patients present multiple bizarre complaints.

Physical examination shows rapid or sighing respiration to be present, with a subjective distress not proportional to the objective signs. The patient will show a high vital capacity if the results are checked by the vitalometer and pulmonary function studies. The three-second expiration test proves normal pulmonary dynamics to be present. Evidence of hyperventilation is often clear, and the patient can be diverted to talk or eat. The laboratory data are all normal, and the patient responds well to sedation and placebo medication, to psychotherapy, or to intravenous ambobarbital. There may be an occasional dramatic response to anticholinergic agents.

All of these criteria may, however, hold equally true for typically allergic patients in whom the triggered bronchial musculature responds with spasm to just one more stress situation. This latter group is not helped to any great extent by psychotherapy.

As an example, one of our patients allergic to feathers and, as is usual in many such cases, to house dust as well, underwent one such psychological storm when, as noted above, the daughter of the president of the firm was given a vacation job beside her. Other similar cases have been described.[4]

Physical allergy is noted when there is bronchospasm following exposure to sudden heat or to cold. The latter may affect the skin, as with exposure to cold air or to cold water, the lungs, when suddenly inspiring cold air, or the gastrointestinal tract, following the ingestion of cold foods or iced drinks.

Reflex asthma may occur alone or in conjunction with other types. Fumes affecting the nostrils, or the presence of polyps, and also pathological lesions external to the upper respiratory tract, may reflexly cause attacks of wheezing.

The cardiac asthmatic patient is placed in a class by himself. The differential diagnosis requires the consideration of many factors, including some of the following. The personal and family history are both usually negative for allergy. The onset of wheezing is late in life, gradual, and often occurs in the prone position, and at night, although not invariably so. The clinical course depends on the cardiac disorder, concerning which detailed knowledge is necessary. If primarily cardiac, the symptoms may be due to impaired blood flow of the heart itself, with anoxemia affecting both the respiratory muscles or the respiratory center. If due to a disturbance of pulmonary circulation, the clinical picture may be quite different, but in any case, the results are shown in abnormalities of gaseous exchange. The evidence of cardiac disease, congestive failure, hypertension associated, perhaps, with tachycardia, arrhythmias, and occasionally with cyanosis, will all point to the correct diagnosis.

The locally obstructive type of bronchospasm is due to foreign body inhalation. It is more often seen in children, but occasionally in adults. If a history of inhalation is denied, physical examination will prove the localized stridor to be present with unequal respiratory excursions, although the wheezing may be bilateral. Evidence of carcinoma should be sought, and the presence of thyroid nodules, Hodgkin's disease, sarcoid, multiple myelomata, and tuberculous glands. Bronchiolitis deformans in patients with arrested tuberculosis, must be ruled out.

One of our patients, a "used-car salesman,"

presented a history of cough and wheeze, present all winter, with only occasional symptoms during the summer months. He blamed his wheezing on the circumstances under which he worked, because it was necessary for him to be either out in the used-car lot, or, between customers, in a small, overheated office warmed by a range oil space heater. The air usually was filled, as well, with the fumes of cigar smoke. The history, however, proved the cough to occur, as well, at home, and especially in bed at night, and when the patient turned on his right side. Examination uncovered the presence of a substernal pedunculated thyroid nodule, pressing on the trachea. Its removal cleared the cough and wheezing, despite exposure to the same "on the job" circumstances.

Workers suffering from wheezing due to drugs or chemicals, may either be responding to their inhalation while at work, or their administration for attendant infection. Of the former, such reactions have been noted in nurses and technicians engaged in preparing antibiotic solutions from the powdered forms. Pharmacists exposed to lycopodium fit into this category. The patient who wheezes at work because of a reaction to a drug administered elsewhere, usually presents a history of illness and of drug ingestion or injection. Treatment at work may, however, be responsible. One of our patients reported to the plant nurse because of a severe headache, telling her that he was sensitive to aspirin. The nurse, ignorant of the origin of the trade name and composition, unwittingly gave him empirin compound, which precipitated one of the most severe attacks we have ever encountered.

In drug allergy, the diagnosis is not usually difficult to make. We must remember, however, that the effects of the drug may be long lasting, and sometimes endure for months. Lists of the drugs which cause bronchial asthma are available.[5]

Recently, Weaver[6] has pointed out that for administrative purposes, the employee with asthma is to be considered as having a permanent disability, his job assignment being handled analogously to that of other handicapped workers, such as amputees or cardiac patients. He, too, points out how surprising it may be, if not difficult, for the employee to comprehend that changing the job may be to his benefit and advantage, especially in the older, long-service employee who may lose the opportunity of utilizing long-acquired skills and experience, and sometimes seniority.

Air conditioning and air purification may, to a certain degree, solve this type of problem. Only with a relatively new product involving the use of hitherto unknown allergens, will consultation with an allergist trained in this field, be necessary. Usually, however, the sensitivities are obvious, and intra-mural adjustments are all that are necessary. Allergens in manufacturing processes cannot long be concealed, because of the epidemic-like nature of the mass response to the pulmonary irritant.

No blanket precautions or over-all treatment schedules can be delineated, for the reason that, of the estimated eight million asthmatic patients known, approximately three million work, and these typify every conceivable type of reaction, in many diverse varieties of exposure. It is a happy commentary on American working conditions that there really are so few who can blame the factory or the mill for their asthma. On the other hand, the patient who is asthmatic must be studied as an individual whose asthma is measured against the background of the occupational and home environment, physical and psychological.

Since no physician can know too much about an asthmatic patient, the plant doctor is in a particularly favorable position to estimate the effects of work environment to perfection. He can, therefore, supplement our present knowledge, and do pioneer work in discovering industrial causes for asthma. Their removal from the patient's job environment will increase the patient's general health, and tend to lessen any asthma he may have at other times, and in other places, when he is not working.

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Wisdom

"Often the convictions of one generation are the rejects of the next. That does not deny the possibility that, as time goes on, we shall accumulate some body of valid conclusions. But it does mean that we can achieve only by accumulation, that wisdom is only to be gained as we stand upon the shoulders of those who have gone before."

—Judge Learned Hand.

The Intervertebral Disc in Forensic Medicine

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CURRENTLY there appear to be diverse views held by apparently honest medical experts testifying in personal injury damage suits in the numerous courts throughout the land; damage suits based upon alleged injuries to the intervertebral disc. On the other hand, medical literature, not hindered by legal necessities, does not reflect the same degree of diversity but, in fact, reveals agreement on many major points. One concludes, therefore, that certain facts remote to medical science have, in some instances, an effect upon the forensic medical opinions expressed. Opinions as to the prerequisites of a diagnosis are many. Thoughts concerning methods of treatment are a little more uniform; but prognostication in forensic medicine is a far cry from the reported clinical results available in many periodicals and medical texts.

Why should there be a difference between medical opinions expressed on a witness stand and those expressed in scientific literature? As previously hinted, alleged legal necessities have their influence but one can also, at times, suspect a pecuniary influence is involved. All doctors supervising disc cases are not qualified to do so, as is readily revealed by their testimony. Even if we assume, however, that all medical witnesses are qualified on this entity, we still are forced to ask: "What do the orthopedic and neurosurgical experts, as a group, believe with respect to the method of diagnosis, treatment, and prognosis in disc cases?" That question is and has been almost impossible to answer. Individual answers are plentiful, but what does the "profession" believe? Perhaps the lack of such information is the major cause for the diversification of forensic opinions.

Assuming that forensic medicine is diversified, why all the fuss? Trial lawyers generally rely on the medical profession to advise them concerning the importance of certain medical criteria in either proving or disproving the relationship of the physical complaints to the alleged traumatic incident. Inadequate and improper advice supported by the same type of testimony affects adversely the plaintiff, the defendant, and the general public. Some plaintiffs have undergone needless surgery with accompanying disability and expense; others continue to suffer from the real cause of their complaints which misdiagnosis has allowed to remain in existence. Still others continue to suffer because the testimony they have heard has convinced them that surgery is dangerous and generally there is a poor chance of recovering their ability to resume their occupation.

Defendants have been made to pay exorbitant amounts based upon an alleged future "permanent and total disability" which failed to materialize. Others have paid judgments for alleged traumatically incurred herniated discs which did not exist. Verdicts as high as $80,000 for disc injuries alone have been rendered by juries confused by medical testimony which is, itself, confused by diametrically opposed statements.

Word of mouth advertising by individual jurors and plaintiffs has spread false ideas throughout the public until many believe that the occurrence of a disc injury is secondary to cancer in its crippling and devastating effect. In view of this entire situation, there was a definite need for clarification of the entire picture which would result in obtaining a utilitarian answer to the question, "What does the profession believe?"

Securing an Answer

IN THE fall of 1953, a questionnaire was prepared to be sent to doctors who had previously made some special study of disc injuries and whose reports had appeared in the literature through the media of periodicals or published texts. The *Index Medicus* and the directory furnished the names and addresses of those chosen at random from this group. There was no thought given as to whether these men were neurosurgeons or orthopedic specialists; whether they frequently appeared in litigation or not. Eighty-seven authorities were polled in this manner. Below is a sample of the questionnaire and its letters of transmittal:

"DEAR DOCTOR: Your name has come to our attention by reason of your work in connection with injuries involving the intervertebral disc. We feel that your opinions will be of value to us in our effort to prepare a digest of knowledge concerning the proper medical handling of this entity. We are sending identical requests for assistance to many specialists throughout the country and the information obtained will be transmitted to a 'master chart' (similar to the one attached) which will show the consensus of the entire group but will not reveal the individual opinions of those contributing. The chart will be duplicated and disseminated to the railroad

industry where it will be of value in the handling of future injuries of this nature. We are also considering the possibility of submitting the 'master chart' and a list of the contributors to the American Medical Association for consideration as possible material for publication in one of their journals.

"With the above in mind, we are requesting you to indicate your opinion of the relative importance of each of the items set forth by grading them on the basis of 1-100 (100 indicating highest degree of importance). You should assume the patient has had no previous medical attention. Provision is made for grading each item on the basis of a personal case as opposed to a liability case (one wherein a belief exists that the injury was caused by the negligence of another and wherein a claim is anticipated). If you prefer to grade without this breakdown, merely write the figure so it covers both columns. Feel free to add other classifications if you desire. An extra copy is attached for your records.

"It will be greatly appreciated if you will also answer the questions pertaining to your qualifications and add any other comments you feel should be included on the subject.

"Yours sincerely. . . ."

The form reply prepared for the doctor:

"DEAR SIR: This will acknowledge receipt of the questionnaire and chart, set forth below, wherein you have requested me to indicate my opinion of the relative importance of each of the items classified under the general headings of: Method of Diagnosis; Causation Opinions; Usual Treatment; and Results—Six Months After Treatment, and pertaining to the subject of intervertebral disc injuries.

"It is my understanding that similar requests are being made of various doctors throughout the United States; that you intend to prepare a 'master chart' setting forth the consensus of the opinions received; that the chart will be duplicated and distributed, and possibly submitted to a trade or professional journal for publication.

"Therefore, as requested, I am grading the relative importance of these items on the basis of 1-100 (100 indicating highest degree of importance). There is no attempt to correlate the four major headings. In the chart the letter 'L' indicates a liability case wherein the patient believes that the injury was caused by the negligence of another and a claim is being made; the letter 'P' indicates the case is a personal one as opposed to the liability type.

"The approximate number of intervertebral disc cases in which I have had an interest is: ———.

"I first came into contact with the disc injury as a result of industrial trauma in ———.

"A list of articles I have written supporting my opinions as set forth follows (by title, name of publisher, volume and date): ———

"So that you will be up to date on my special qualifications, below are societies of which I am a member and organizations to which I am professionally attached: ———

"Yours very truly. . . ."

In addition to securing the needed data by the above method, the following doctors were gracious enough to permit interviews on the subject: Henry C. Marble, Boston; Alexander P. Aitken, Boston; C. C. Guy, Chicago; and John V. Walker, Chicago. Information from these gentlemen was gratefully received. It is not implied, however, that they are either in agreement or against the opinions advanced herein.

The Answer

PURSUANT to the agreements made in the foregoing correspondence, set forth below is the master chart (Table II, page 38) showing the consensus of the relative importance of the various phases of diagnosis and treatment, with an expression of the consensus pertaining to causation and results. The 30 authorities contributing to these averages are: Walter Z. Baro,

TABLE I.
THE INTERVERTEBRAL DISC CHART

METHOD OF DIAGNOSIS	*L	**P	CAUSATION OPINIONS	*L	**P
History			Recent specific trauma to normal spine		
Subject complaints			Ancient specific trauma to normal spine		
Objective findings (sans x-ray)			Developmental degeneration of disc		
Conventional x-rays			Dramatic traumatic aggravation degenerated disc (1)		
Myelogram					
Discogram			Dramatic traumatic aggravation congenital anomaly (1)		
Differential diagnosis					
Exploratory operation			Chronic trauma to normal spine (2)		
			Chronic trauma to predisposed spine (2)		
USUAL TREATMENT	***L**	****P**	*****RESULTS—SIX MONTHS AFTER TREATMENT**	***L**	****P**
Conservative (including use of hard bed, traction, cast, medication, belt, massage)			Good—No objective findings; no subjective complaints		
Operational with fusion			Fair—No objective findings, minor subjective complaints		
Operational non-fusion					
			Poor—Objective findings and subjective complaints		
			Very poor—Permanent total disability		

*L—Liability cases. **P—Personal cases. ***—High-grade indicates frequency.
(1)—A definite, specific, instantaneous trauma.
(2)—Usual minor traumas of everyday life—ordinary "wear and tear."

West Covina, California; Joseph S. Barr, Boston; W. A. Bishop, Phoenix, Arizona; F. Keith Bradford, Houston, Texas; Guy A Caldwell, New Orleans; Fremont A. Chandler, Chicago; Ralph B. Cloward, Honolulu, Hawaii; W. James Gardner, Cleveland; Stanton L. Goldstein, Moline, Illinois; E. S. Gurdjian, Detroit; Frederick W. Ilfeld, Beverly Hills, California; Franklin Jelsma, Louisville, Kentucky; J. Albert Key, St. Louis; Paul B. Magnuson, Chicago; Harry P. Maxwell, Milwaukee; Earl D. McBride, Oklahoma City; Edmund J. Morrissey, San Francisco; Marion B. Noyes, Salt Lake City; William T. Peyton, Minneapolis; Frank N. Potts, Buffalo, New York; Charles Rombold, Wichita, Kansas; W. B. Scoville, Hartford, Connecticut; R. Glen Spurling, Louisville; Arthur Steindler, Iowa City, Iowa; Frederick R. Thompson, New York; Henry F. Ullrich, Baltimore; J. J. Van Driest, Milwaukee; Harold C. Voris, Chicago; Benjamin B. Whitcomb, Hartford, Connecticut; and Albert A. Wilson, Tampa, Florida.

The above listed doctors contributed only to the chart (Table II) and are not responsible for the comments expressed in this paper. It should be borne in mind that the figures charted are not percentage figures but rather represent relative importance. Some authorities used a grade of 100 two or three times under one major heading, indicating they felt that each item, so marked, was equally very important.

Interpreting the Answer

CAUSATION OPINIONS: It is apparent that the industrial patient's history of the onset of his disturbance has influenced the opinions as to causation. It is to the financial advantage of the injured worker to connect his disability to a specific traumatic incident occurring in the course of his employment and arising out of it. It makes little difference, legally, whether the trauma originates the condition or aggravates a pre-existing one. We see, therefore, a grade of 62.2 and a grade of 62.0 for the items of Dramatic Traumatic Aggravation of a Degenerated Disc and Recent Specific Trauma to a Normal Spine. In the personal cases, wherein the authorities can put more faith in the patient's history, the relative values are 10 to 12 points lower for these two causes. It is also noted that only a 4.98 differential exists between the first and fourth cause in personal cases as compared to a 20.75 differential in the legal cases. This indicates that personal cases are influenced less by ulterior motives

TABLE II.
CONSENSUS OF REPORTING AUTHORITIES REGARDING CAUSATION, DIAGNOSIS, TREATMENT, AND PROGNOSIS OF THE HERNIATED LUMBAR DISC WITH RUPTURE OF THE NUCLEUS PULPOSUS

CAUSATION OPINIONS	Doctors Replying	Legal Cases	Doctors Replying	Personal
Recent specific trauma to normal spine	30	62.0	30	51.66
Ancient specific trauma to normal spine	28	44.8	28	48.2
Developmental degeneration of disc	25	39.7	26	40.53
Dramatic traumatic aggravation degenerated disc (1)	25	62.2	25	50.2
Dramatic traumatic aggravation congenital anomaly (1)	26	21.96	26	21.15
Chronic trauma to normal spine (2)	25	34.8	26	34.3
Chronic trauma to predisposed spine (2)	24	41.45	25	46.68
METHOD OF DIAGNOSIS				
History	28	68.9	27	74.4
Subjective complaints	29	63.8	27	82.1
Objective findings (sans x-ray)	30	83.26	29	83.55
Conventional x-rays	29	43.37	29	43.7
Myelogram	29	51.3	29	50.6
Discogram	14	22.8	14	22.5
Differential diagnosis	21	52.8	21	51.1
Exploratory operation	25	35.4	25	39
USUAL TREATMENT				
Conservative (including use of hard bed, traction, cast, medication, belt, massage	27	72.74	27	70.1
Operational with fusion	26	33.28	25	36.70
Operational non-fusion	27	51.64	26	53.86
***RESULTS—SIX MONTHS AFTER TREATMENT				
Good—No objective findings; no subjective complaints	27	39.11	27	58.48
Fair—No objective findings; minor subjective complaints	27	43.81	27	42.74
Poor—Objective findings and subjective complaints	26	21.96	26	9.03
Very Poor—Permanent total disability	25	9.87	24	3.3

(1)—A definite, specific, instantaneous trauma.
(2)—Usual minor traumas of everyday life—ordinary "wear and tear."
***—High-grade indicates frequency.

and the doctor has more of an opportunity to arrive at a scientific conclusion as to causation.

METHODS OF DIAGNOSIS: Here some very revealing figures are found. It is obvious that our experts feel they cannot place as much faith in the History and Subjective Complaints of the legal patient (for previously mentioned reasons) as they can in the personal cases. The difference is not as widespread under the item of History as it is in Subjective Complaints. The most important criteria in diagnosing a legal case are: Objective Findings; History; Subjective Complaints; and Consideration of Differential Diagnosis. In the personal cases almost equal weight is given to Objective Findings and Subjective Complaints. It can be stated that History, Subjective Complaints, and Objective Findings are a must for the first three considerations in the diagnosis of any case (not just disc cases); therefore, it is gratifying to see Differential Diagnosis take first place among the really elective items. Forensic medicine overruns with testimony indicating that little, if any, effort was made to determine whether some other entity was the actual cause of the patient's complaints and disability. Many reporters are convinced that lack of proper consideration of Differential Diagnosis was the cause of earlier reported poor results in the treatment of low back pain diagnosed as being caused by the herniated disc. It is common to hear doctors (specialists included) testify as to a positive and absolute diagnosis based upon a cursory examination, when they know that even after using all of the diagnostic aids, operation is the only definite means of confirming the existence of the lesion.

In the past year or so, several texts have stressed the importance of considering differential diagnosis thoroughly and, at my request, a surgeon of many years of experience in dealing with industrial trauma has prepared a chart which clearly sets forth the many separate entities capable of simulating the signs and symptoms of the classic disc. The probable frequency of their occurrence is also shown (Table III).

Based upon medical literature, laymen involved in disc claims should be able to assume certain facts as being true and no longer subject to debate. Some of these facts are:

1. A true herniated disc can exist without pro-

TABLE III.
DIFFERENTIAL DIAGNOSIS WITH RESPECT TO THE INTERVERTEBRAL DISC

GENERAL DISEASE CLASSIFICATION	FREQUENCY OF OCCURRENCE			
	FREQUENT	COMMONPLACE	OCCASIONAL	RARE
Diseases of spinal cord			Neurofibromata	Syphilis Lateral sclerosis Multiple sclerosis Syringomyelia Hematomyelia Tumors of cord & equina
Inflammations (neuritis)	Focal infections: teeth, tonsils, sinuses, etc.	Polyneuritis	Herpes zoster (shingles) Diabetes	Alcohol Chronic poisonings: arsenic, lead, tobacco Vitamin deficiencies
Diseases of coverings of cord				Arachnoiditis Hemorrhages Abscesses
Diseases of muscle	Myositis			Hemorrhages Tumors
Diseases of bones and ligaments	Hypertrophic arthritis Bursitis Fibrositis	Osteomalacia Spondylolithesis Narrowed foramina Episacral fibrolipoma Primary osteoma	Atrophic arthritis Gout Rheumatoid arthritis Periostitis Vertebral epiphysitis Metastatic carcinoma	Spondylitis Tuberculosis Osteomyelitis Paget's disease Syphilis Hypertrophic ligamentum flavum Hyperparathyroidism Primary bone cysts & Sarcoma Multiple myeloma
Structural disorders	Congenital anomalies Obesity	Knock knees Hernia Flat feet Scoliosis Unequal leg length	Old poliomyelitis	
Diseases of blood vessels		Arteriosclerosis	Buerger's disease	Periarteritis nodosa Aneurysms
Generalized disorders	Psychoneurosis			Endocarditis Blood dyscrasia Nutritional disorders
Injuries	Fractures Prolonged effort Occupational stress Lumbosacral strain Sacroiliac strain		Calcified hematoma	Spinal concussion
Diseases of systems	Prostate & urinary tract Gynecological disorders	Gastrointestinal Biliary tract Kidney lesions	Pancreas lesions Cardiac lesions Lung lesions Neck lesions Cervical rib	Splenomegaly Adrenal tumors Retroperitoneal tumors

ducing any of the classical signs and symptoms or it may produce them all or any combination.

2. Each of the separate entities listed on the chart *can* produce signs and symptoms simulating those of the herniated disc.

3. The only *positive method* of determining the existence of a ruptured and herniated disc is by operation. Myelography, discography, electromyography, and conventional x-rays *may* only assist in localizing a *lesion*; they do not tell what the lesion is and quite often fail to reveal an existing lesion later found during operative procedure.

4. Technically, the outer walls (annulus fibrosis) of the intervertebral disc can *rupture*, while the interior nucleus pulposus may, or may not, *herniate* through the rupture. To produce the classic complaints of a true herniated disc, the nucleus pulposus *must herniate* through the rupture at a place where it can irritate nerve roots. Eventually collapse through degeneration will also possibly cause this irritation.

5. Intervertebral discs *normally* have a bulging appearance which varies in individuals. The disc between L5 and S1 is normally more narrow than the other lumbar discs. The thickness in *normal* discs can vary from those immediately above or below, and the thickness in a disc can vary from the time of arising to the time of retiring; therefore, the importance of a *narrowed interspace* in diagnosis is insignificant. Based on its existence, the doctor may be entitled only to *suspect* an *abnormal* disc.

6. If diagnosis is partially based upon a narrowed disc (or interspace) shown in a conventional flat plate x-ray, it should be determined that the center of the x-ray tube was directly over the disc under discussion, thereby eliminating distortion.

USUAL TREATMENT: There seems to be little question on this subject. Many of the authorities advised that conservative treatment should always be instituted first, and, if unsuccessful, should then be followed by surgery, if indicated. Only one doctor was in favor of operational correction without regard to prior conservative treatment. There did exist some difference of opinion as to the duration of unproductive conservative therapy before the institution of the more radical surgical procedures.

RESULTS—SIX MONTHS AFTER TREATMENT: Several of the authorities criticized the "six months after treatment" stipulation and paid little or no attention to it. Here again it is interesting to compare the legal cases with the personal. One would guess that again extraneous facts have an effect on the consensus concerning prognosis —or, it would be more accurate to say, on the end results claimed by the industrial patient. A conclusion would be justified that the 3.3 average shown in the personal column with respect to Very Poor, is more scientifically accurate than the 9.87 average in the legal column for the same classification. One might believe the latter is inspired by the plaintiff's allegations influenced by the dollar sign. It is encouraging to see the comparative high averages given to Good and Fair results over Poor and Very Poor results. Very Poor, incidentally, appears generally only in forensic medicine through the courtesy of the plaintiff's medical witness.

Conclusions

IT IS generally recognized that the questionnaire method of obtaining opinions is limited by the difference in interpretation of the questions by those attempting to answer them as well as the interpretation by the reviewer of the answers received. In addition, the system of transposing an opinion into a figure to demonstrate the relative importance of the opinion (or item discussed) is new, it is believed. The value of such a combined device is, however, obvious. It is hoped that formal medical societies, associations, or other groups can refine and develop the procedure so that it can be used in connection with many subjects confounding the medical and legal professions, as well as the public at large. It is suggested that specialty boards could poll their entire memberships on important questions.

It is hoped, in particular, that this study proves to be of value to plaintiffs, defendants, doctors, attorneys, and juries engaged in trying damage suits involving alleged disc injuries, so that justice to all will be more prevalent. Justice is not served by twisting words to make them appear as honest facts. It is, of course, necessary for an attending physician or surgeon to establish a "presumptive diagnosis" based upon clinical information plus that produced by the aforementioned techniques, if he intends to effect a cure by either conservative or operative procedures; but when testifying prior to actual operation, the jury should be advised that the diagnosis is "presumptive" and not "confirmed."

When the hypothetical question is used, the honest doctor will make certain the jury is advised that the accident described "could or might be related to the injury and also that it might not be related to the plaintiff's complaints." This is true with a confirmed diagnosis but especially true when dealing with the "presumptive diagnosis." The truth, the whole truth, and nothing but the truth pertains to all witnesses who take the stand and, by adhering to this principle, justice will become a reality.

A realistic review of the present-day situation does not reveal any trend toward honesty on the witness stand; rather it is apparent that the opposite is true. More and more examples of exaggerated and untruthful testimony are coming to light each day. The problem is one which rightfully deserves the attention of the medical profession as a whole and those specializing in industrial cases (wherein the abuse is most widespread) in particular. It is sincerely hoped that the medical associations, societies, and boards will give serious thought resulting in a definite action restraining those guilty of infractions of ethics and of practices contrary to their oath.

(59 E. Van Buren Street.)

The Ramazzinians

The Fifteenth Year and Ninth Rendezvous

THE 1954 "Little Modena" of the Ramazzinians was Plantation Harbor deep in the Keys below the Florida coast. This facility and all facilities for the year were provided by the current servants, Drs. George Gehrmann and Willard Machle. The Ramazzinians present, together with their guests, furnished the allowable complement of 31.

No Ramazzinian as an individual, nor the group in its entirety, fully grasps the power that yearly brings together this assemblage of these physicians all well burdened with their respective stints in occupational health the country over. Yet they come, and their coming will not be denied. It is possible to describe a Ramazzinian but never to define one. It does not follow that every physician in occupational health however scientific in attainments or however socially and culturally adroit is qualified. The undefinable cohesion—the veritable Dejanira shirt—appears to reside in the seeking of the stark and unadorned facts of occupational health from peers stripped at least for the time being of all guile, self-seeking or machinations.

The writer of the Apochryphal Ecclesiastus, whoever he may have been, had no Ramazzinian in mind as he wrote, but somewhat closely he touched him when he penned:

THE wisdom of a learned man cometh by opportunity of leisure; and he that hath little business shall become wise.

"How can he get wisdom that holdeth the plough, and that glorieth in the goad, that driveth oxen, and is occupied in their labours, and whose talk is of bullocks?

"He giveth his mind to make furrows; and is diligent to give the kine fodder.

"So every carpenter and workmaster, that laboureth night and day; and they that cut and grave seals, and are diligent to make great variety, and give themselves to counterfeit imagery, and watch to finish a work.

"The smith also sitting by the anvil, and considering the iron work, the vapours of the fire wasteth his flesh, and he fighteth with the heat of the furnace; the noise of the hammer and the anvil is ever in his ears, and his eyes look still upon the pattern of the thing that he maketh; he setteth his mind to finish his work, and watcheth to polish it perfectly.

"So doth the potter sitting at his work, and

Some of the Ramazzinians in attendance.

Plantation Yacht Harbor on Plantation Key, Florida site of 1954 Ramazzini sessions.

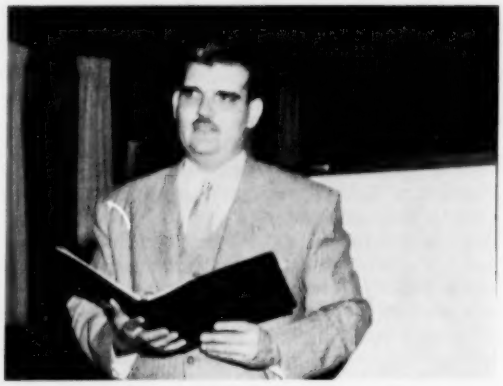
A well-appointed auditorium is not requisite to a successful medical meeting.

turning the wheel about with his feet, who is always carefully set at his work, and maketh all his work by number;

"He fashioneth the clay with his arm, and boweth down his strength before his feet, he applieth himself to lead it over; and he is diligent to make clean the furnace.

"All these trust to their hands; and every one is wise in his work.

"Without these cannot a city be inhabited; and they shall not dwell where they will, nor go up and down;



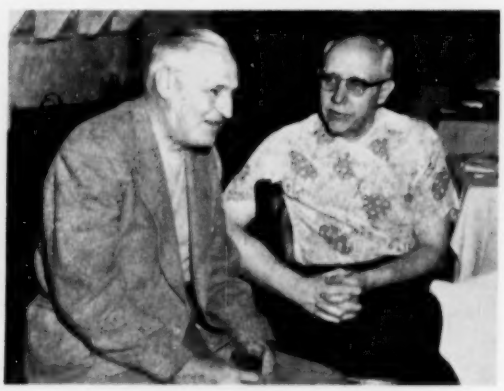
Dr. Rafael Penalver, the 1954 Ramazzini Orator.

Servants for the year: Drs. Willard Machle and George Gehrmann.

"They shall not be sought for in public counsel, nor sit high in the congregation, they shall not sit on the judges' seat, nor understand the sentence of judgment; they cannot declare justice and judgment; and they shall not be found where parables are spoken.

"But they (those others) will maintain the state of the world and (all) their desire is in the work of their craft."

DEPARTING from the ecclesiastical and only professing to penetrate the minds of the Ramazzini Society members, it may be believed that



The scientific discussions were unplanned and informal.

Serious moments.

Photos by Dr. Harley Krieger, "Official Photographer."

Daytime meeting place.

their infrangibility stems from such essences as these: the ability to see themselves shorn of all the artificial protective shells with which men inevitably clothe themselves in adjustment to the impositions of life. Few men are the men that they as boys contemplated. As a well sintered Ramazzinian, he finds traces of the boy's man. To a degree he may reassemble himself to the boy's specifications. And more, in the unplanned talks, 75% of the listeners can understand 50% of the basic occupational health pronouncements. Where else may this be achieved? Agreement is not requisite, and hearty derisive rejection is the order. Deceit is scorned, but raucous scientific belittlement becomes a fine art. Unexpected science puts in its appearance, and scientific unexpectedness takes its turn. Withal there is the leisure; the unscheduled hours of "little business." Out of such comes wisdom, or the opportunity for wisdom, and the world of occupational health profits.

All this revealment into the innermost of the Ramazzini Society may be labeled as treachery, so let there be resort to the often-stated: "The Ramazzini Society has no objectives and no purposes." There is the one exception—the Annual Oration. This year's address, entitled "Manganese Poisoning," was presented by Dr. Rafael Peñalver whose own investigation of that disease in the clinic and the laboratory fully qualified him with

Servants for 1955: Drs. George Wilkins and Robert C. Page.

authority, and whose social graces led him into the warmth of the Society. The two combined made him the newest "overseas" member of the group. His oration appears as the lead article of this issue.

THE Ramazzini Society is no counting house of occupational health, and nowhere is there such a counting house, but wherever it assembles that place becomes an honest temple with its shrines. Those undiscernable shrines for the next year were turned over to the new servants, Drs. George Wilkins, of Boston, and Robert Page, of New York.

Frankford Arsenal Certified by Occupational Health Institute

FRANKFORD Arsenal, one of the Army's largest establishments, operated by the Ordnance Corps in Philadelphia, was acclaimed on November 17, 1954, for providing employees with "the best kind of constructive health service, aimed at keeping workers well and cutting the incidence of accident and disease."

Left to right: Glenn S. Everts, M.D., Brigadier General Joseph M. Colby, and Laurence P. Devlin, M.D.

At ceremonies in Philadelphia the Arsenal was presented with the Occupational Health Institute's Certificate of Health Maintenance, signifying that the health service meets the standards set by the Industrial Medical Association.

The Certificate was presented to Brigadier General Joseph M. Colby, Commanding, by Glenn S. Everts, M.D., Regional Consultant of the Occupational Health Institute. In accepting the honor, General Colby said that credit was due the Arsenal's entire working force, and particularly the medical staff, headed by Laurence P. Devlin, M.D., Medical Director. "To carry out a program of this kind, management can only provide the facilities and staff. The medical schools and hospital teaching centers must produce skilled doctors, nurses and technicians imbued with the philosophy of preventive medicine as well as an understanding of industry and its problems. Employee Utilization Branch must help educate people to use Arsenal facilities and take advantage of opportunities for voluntary annual health inventories. Management must be interested in and enforce the periodic health examination program to eliminate adverse effects of handling toxic or hazardous materials. Manpower is vital and must be preserved."

General Colby described the Arsenal's program as "a dramatic contrast to the old-fashioned company medical service which was little more than a first-aid station, seen only by the sick or injured employee."

GEORGE H. GEHRMANN, M.D., Associate Medical Director of the Du Pont Corporation and a Trustee of the Occupational Health Institute, was the principal speaker, drawing upon a wealth of material accumulated in 40 years as head of Du Pont's Medical Department. He stressed the importance of annual health inventory examinations, such as are given by his department to over 90% of the Du Pont employees. "There is no overstating the value of a program like this," he said. "Here is a way to detect disease, whether cancer, heart, diabetes or many other conditions, in time for something constructive and curative to be done. It is impossible to measure the net benefits of such a program in terms of improved employee morale, efficiency and productivity, and reduced absenteeism, labor turnover, and compensation insurance premiums. But the most important benefit is seen in what programs like this,

Left to right: George Gehrmann, M.D., Trustee, Occupational Health Institute, and General Joseph M. Colby, Commanding Frankford Arsenal.

in plants and offices throughout the country, could mean in terms of community health and national production, strength and security."

The Occupational Health Institute, established under the joint sponsorship of management and medicine, is a non-profit organization with headquarters at 6 East 39th Street, New York 16. Its purpose is to help management to establish sound health practices and programs, and to accredit those meeting standards. To be accredited, companies must (1) have a stated medical policy; (2) perform preplacement medical examinations; (3) perform periodic physical examinations on all employees exposed to industrial hazards; (4) have available facilities for voluntary annual physical examinations for all employees; (5) maintain a competent consulting staff; (6) give attention to sanitation, safety precautions and industrial hygiene; (7) have the chief medical officer or adviser report to some responsible member of management who is conscious of and familiar with managerial interpretation of medical policy; (8) maintain a well-equipped dispensary for emergency care as well as for preplacement and periodic examinations; and (9) have medical and nursing personnel who are graduates of accepted schools of learning and who are in good standing and properly licensed to practice.

ALL ECHELONS of Army Medical Service were represented at the ceremonies by Colonel Dixon Holland, M.C., Chief of Occupational Medicine of the Surgeon General's Office; Colonel Francis P. Kintz, Surgeon, Second Army; and Lieut. Colonel Irvine H. Marshall, M.C., Preventive Medicine Division, Second Army.

Dr. Devlin, the Arsenal's Medical Director, is a Colonel in the Medical Corps Reserve, assigned to Second Army Headquarters Augmentation Unit, and is on the faculty of the Woman's Medical College, Philadelphia, as Associate in Occupational Medicine.

Colonel Kintz, commenting upon the quality of health service available to employees of Frankford Arsenal, expressed the hope that all industrial medical programs under the professional supervision of his office will soon be in a similar favorable condition.

Colonel Holland, who has been working jointly with the Navy and Air Force Medical Services to attain uniformity in Armed Forces civilian employees health programs, stated that the Armed Forces will be able to compete favorably with private industry in this field as soon as they are in a position at local level to secure professional men with the proper qualifications and motivations. Occupational medicine is a relatively new specialty, and the Surgeon General, who is always alert to conservation of manpower, has established an office to assist and advise Army Surgeons in this field.

AS OF December 31, 1954, the Certificate of Health Maintenance had been awarded by the Occupational Health Institute to 31 companies.

Sometimes the Award was given at a public presentation. Kimberley Clark Corporation, Memphis, Tennessee, Lever Brothers Company, Baltimore, Maryland, Sperry Gyroscope Company, Great Neck, Long Island, and United Parcel Service, New York City, are among the recipients of the Certificate who made the presentation a matter of ceremony. These are in addition to the United Nations Medical Service (*Indust. Med. & Surg.*, 23:9, 411 (September) 1954) and the Frankford Arsenal.

Educating the Private Practitioner

RECENTLY, because of current interest in direct medical service plans sponsored by unions or management, an important Committee on Medical Care Plans for Industrial Workers has been developed jointly by the Council on Industrial Health and the Council on Medical Service. Originally, major effort was directed at cash sickness benefit programs such as now are operative in Rhode Island, California, New York and New Jersey. Surveys have been made of union health and welfare programs, and our interest is now extending into the management-sponsored programs. Also, since sickness absenteeism looms so large as a factor in industrial production, this committee has been assigned the task of investigation. A ready solution is not apparent but one course is clear, namely, to keep the lines of communication open between private and industrial physicians. Since the private practitioner in almost every instance is the arbiter, it becomes necessary to educate him relative to the importance of improved standards in regard to certifying lost time from illness. We recognize this is a long-range educational program. The Industrial Medical Association has indicated its willingness to assist, through documentation of various undesirable practices.

—From "Role of the Council on Industrial Health," by CARL M. PETERSON, M.D.

American Association of Industrial Nurses

A Report by EDNA MAY KLUTAS, R.N.
Field Consultant
New York City

ON OCTOBER 19, 1954, MRS. MARGARET S. HARGREAVES assumed her duties as Executive Director of the American Association of Industrial Nurses. MRS. HARGREAVES comes to AAIN from the Liberty Mutual Insurance Companies where she held the position of Division Health Consultant. Prior to her 10 years with Liberty Mutual, she worked as plant nurse for Pepsi Cola Company, Long Island City, and Gimbel's Department Store, New York City. She also has had varied organizational experience in the New York City Industrial Nurses Club and the New York State Association of Industrial Nurses, and, most recently, has been on the Board of Directors of AAIN. She succeeds Mrs. Gay Merrihue who is retiring after serving as Executive Director since 1944.

Mrs. Hargreaves

AAIN Professional Standards Committee

THE Professional Standards Committee of the American Association of Industrial Nurses is currently conducting its periodic review and revision of material which has been prepared by the Committee and published by the Association. This work has been divided into separate projects which were assigned to four Area Sub-Committees from the Industrial Nurses Association of Philadelphia, the Michigan State Association of Industrial Nurses, Texas State Industrial Nurses Association, and Southern California Industrial Nurses Association.

Project I—Revise and develop the "Qualifications of an Industrial Nurse" to set forth criteria for judging industrial nurses.

Project II—Revision of "Duties and Responsibilities of the Industrial Nurse" to define and set forth criteria for judging the assignments and performances of industrial nurses in a specific job situation.

Project III—Define and set forth the objectives of the industrial nurse in planning, developing and operating a nursing service in industry.

Project IV—Study and set forth criteria whereby a nursing service in industry may be evaluated in the light of a theoretically ideal nursing service program.

Educational Programs

THE LOCAL and state associations of AAIN have been active in presenting educational programs on industrial nursing for their members. The programs were planned to assist new and experienced industrial nurses working alone or under supervision in small or large plants. The general purpose was to develop a new awareness of how the industrial nurse may function in her own work situation. It was felt that the new knowledge the nurse would gain should broaden her thinking, strengthen her position, and help her promote better health and welfare services for employees, employers, and the community. The programs which have been completed are:

October 8-9, 1954: Symposium on Industrial Nursing presented at Union University, School of Nursing, Albany, New York, by the New York State Association of Industrial Nurses, Union University School of Nursing, and Liberty Mutual Insurance Companies.

October 23 and 30, 1954: Industrial Nursing Institute presented at the Catholic University of America, Washington, D.C., by Catholic University and the Metropolitan Washington Industrial Nurses Association.

October 29-30, 1954: Industrial Nursing Institute presented at St. Louis University School of Nursing, by the St. Louis Industrial Nurses Association and St. Louis University.

October 29-30, 1954: Symposium on Industrial Nursing presented at Furman University, Greenville, South Carolina, by the South Carolina Industrial Nurses Association, Furman University, and Liberty Mutual Insurance Companies.

November 6,13,20, 1954: Symposium on Industrial Nursing presented at Baylor, Texas, by the Houston Branch of AAIN, Baylor University, and Liberty Mutual Insurance Companies.

Among the topics covered by the various programs were:

Recent Advances in Medicine and Surgery as Applied to Industrial Health.
The Industrial Nurse's Role in the Preventive Approach to Industrial Health.
Use of Community Resources.
Workmen's Compensation.
Rehabilitation.
Industrial Medical Records and Reports.
Health Guidance in Industry.
Inter-Personal Relations in Industry.
Legal Aspects of Industrial Nursing.
Development, Administration and Supervision of Industrial Nursing Services.

Absenteeism.

Fundamentals of an Effective Plant Medical Program.

Industrial Hygiene. Industrial Safety.

Counseling.

Occupational and Non-Occupational Diseases.

The programs were well-attended and well received by the industrial nurses, many of whom asked that similar programs be repeated. There was considerable interest in the discussions on recent advances in medicine and surgery, counseling techniques and human relations, compensation and legal aspects, records and reports, development and fundamentals of the industrial nursing service, and health education programs. The participants were especially enthusiastic about the opportunities for presentation and discussion of individual questions and problems.

At the annual state meeting, October 15-16, 1954, the Michigan State Association of Industrial Nurses held a two-day session devoted primarily to the discussion of records and reports, workmen's compensation, and legal aspects of industrial nursing. Although not officially classified as an Institute, the meeting provided the attending nurses with considerable concentrated material on the topics discussed. It has become the practice of MSAIN and other state associations to make the annual meeting educational, along with conducting the necessary business.

Efforts are being made further to meet the educational needs of industrial nurses. Evidence of this is seen in the programs planned for early 1955. New York University, in cooperation with the New York City Industrial Nurses Club, will present its third Lecture Courses series in March. The Long Island Industrial Nurses Association, with Adelphi College, will give a Lecture Series in February and March. The Detroit Industrial Nurses Association is collaborating with the Detroit Industrial Physicians Club which initiated a Lecture Series to be presented in various plants by the plant physicians. The Detroit nurses are particularly pleased to have this support and cooperation of the industrial physicians. The first repeat performance of a symposium will occur in May, 1955, when the Massachusetts Industrial Nurses Association will present its second Symposium on Industrial Nursing in Boston.

It is the aim and purpose of the American Association of Industrial Nurses to continue to stimulate and support the local and state associations in such educational endeavors as are now being made. With each institute, symposium, lecture series, or other type of educational program, more nurses are made aware of the challenges facing the nurse in industry for the improvement of industrial health.

Fifteenth Annual Congress on Industrial Health

ON JANUARY 25-26, the Fifteenth Annual Congress on Industrial Health will take place at the Shoreham Hotel in Washington. The Council on Industrial Health of the American Medical Association is happy to share sponsorship on this occasion with the Medical Society of the District of Columbia. Although there are few industrial physicians in the conventional sense in Washington, there are a sizable number who have a stake in the further development of health and medical care plans for industrial workers. In any case, this Conference is intended to provide an opportunity for medicine, labor, management, and government to exchange views. It also points up the need for clearer understanding of motivations as between industrial physicians, private practitioners, and community health services.

A special effort is made at these conferences to attract attendance from state medical societies and from the professional societies directly concerned. A number of agencies in Federal government are prominently engaged in the industrial health field and the selection of Washington as a meeting ground provides an opportunity to observe these workings at closer range.

This Fifteenth Congress is primarily concerned with the need for freer communication. The opening general session will discuss the role of medicine in an industrial society, both in terms of newer techniques and social consequences. The Council on Industrial Health regards this area as of vital concern to medicine and is asking on this occasion the advice of management, labor, and official agencies.

The remainder of the time will be devoted to group discussion. One such group will be concerned with more effective use of industrial health as a major factor in community health. In so doing, especial attention will be paid to a reappraisal of the present health status of the working population and what is needed by the associated professional groups to do a better job. Also in consideration of the rapidly broadening area of negotiated health benefits, this group will explore the relations between industrial medicine and the economics of medical care and will attempt to determine if it is desirable at the present time to set up some form of joint agency intended to advance industrial health.

Another group discussion will look searchingly at the impact of the atomic energy industry on community life. There are pending decisions of great moment relative to the selection of sites for atomic energy reactors. There will be health problems associated with normal operation as well as the possibility of accidents and disaster. Perhaps of more widespread significance will be the use of isotopes in industry, in radiochemical processing and in medical practice. The record of the Atomic Energy Commission so far suggests that the transition from government to private control will take place with clear understanding of the industrial and community health aspects.

The third panel will consider the challenge of occupational disability. Involved are a reappraisal of workmen's compensation in terms of the rising importance of rehabilitation and a survey of the role medicine should occupy in this area, both professionally and as citizens in an industrial society.

Industrial Medical Association

President's Page

As several of the Regional Consultants of the Occupational Health Institute have asked for additional information in regard to their particular assignments, the following is called to the attention of all concerned.

The program of professional evaluation of medical services in industry is definitely a function and duty of the Industrial Medical Association. Standards are set by a Committee of the IMA. The Committee reports to two directors, who in turn present their recommendations to the entire board for appropriate action.

The President and the President-Elect of the IMA are Trustees of the OHI, and it is their duty to explain to the Board of Trustees the needs and recommendations of the IMA.

One of the purposes of the OHI is to obtain funds necessary to carry out the individual evaluations of medical facilities upon request.

At least the services of one full-time professional person are required to formulate a coordinated plan of action. In the interim, and in a conscientious effort to live up to the commitments made by the officers of the IMA in the past, it has been considered advisable to ask for assistance from the leaders of industrial medicine in the field who have shown interest in the activities of the IMA. Each individual so approached—District Counselors as well as others—has been asked to assist purely on a voluntary basis.

It should be understood that no member of the IMA whose own medical unit has not been previously certified by the OHI would be eligible to act as Consultant. Further, no Consultant would be asked to survey a unit having an employee medical service known by him to be lacking in respect of one or another of the IMA minimum standards unless the Medical Director of that unit requested such a survey with the purpose of seeking advice and guidance as to how his particular service might be improved. In other words, the Regional Consultant is ready to give the unit requesting advice the benefit of his experience. Final decision as to whether certification is awarded rests, in the last analysis, with IMA.

It is neither the intent nor purpose of the OHI to supplant any existing agencies in the field who act as consultants on a fee-for-service basis. Where medical facilities exist, the OHI will evaluate them in terms of "existing minimal standards." For required advice over and beyond this, reference to accepted agencies will be made. The following communication will illustrate this point: A member of the OHI writes to headquarters, ". . . . who can we get to come into our plant and make an accurate determination of: (1) The amount of dust in the air. (2) Its intimate character. (3) Whether it is harmful in these combinations. And (4) to counsel with us in regard to the elimination of this dust."

OHI headquarters' reply: "In response to your letter of December 17 we would suggest the following three organizations as possible sources for the particular survey you require.

"1. *Industrial Hygiene Foundation of America,* Mellon Institute, Pittsburgh. This organization is well equipped and has competent personnel for field work. They are in a position to develop all of the information necessary in answering this kind of problem. Their services are available on a fee basis.

"2. *Division of Industrial Hygiene,* State Department of Health. A number of states maintain Divisions of Industrial Hygiene with personnel and facilities for field service to various plants in their respective states. It is probable that the services of this organization could be obtained without obligation or cost. Most of the states have competent people and do creditable work.

"3. (Here is mentioned the name of a private consultant firm of industrial hygienists in the area from which the inquiry came.)"

Any Consultant, as a representative of IMA and OHI, renders his service in a philanthropic manner in accordance with the basic commitments of the AFOH, now the OHI.

As soon as enough doctors in industry understand the purposes of the OHI and become active members—only 1,000 memberships at $100 are required—the field of industrial medicine in terms of managerial appreciation and understanding will reach a new and long overdue high in occupational health affairs.

Letters

Testimony in Personal Injury Suits

TO THE EDITOR: Elsewhere in these pages there appears an article by Bruce H. Smith on "The Intervertebral Disc in Forensic Medicine." This is well worth reading by all members of the Industrial Medical Association and all doctors and lawyers who are engaged in any phase of medicolegal work. It suggests an approach to a controversial subject in surgery, an approach which is new and which may represent the best way to obtain a "majority opinion."

This article touches on another situation which involves some very dirty linen in the medical profession. It may be that this linen will require a public washing before it is clean; however, associations of various corporations are attacking the problem as it should have been attacked long ago, and it may be that their work, with the cooperation of various medical groups, will save our profession from having publicly to acknowledge that there are rascals in our midst. Campaigns against "ambulance chasing" by the legal profession are well-known and the evils of this practice do not need to be discussed. What the general medical profession does not realize is that the clever and often unscrupulous personal injury attorney, who collects exorbitant fees from large settlements and jury verdicts, can accomplish his objectives only by the testimony of one or more physicians.

In one large city in the Middle West there are only five or six of these "professional medical witnesses" who repeatedly appear on the witness stand in support of the claims made by the same group of claims attorneys. These doctors may see the injured man once or twice, one or two years after his injury. By that time his well-considered and often well-coached complaints are glibly recited to the doctor chosen by his attorney; and this doctor, in turn, recites all of the subjective symptoms to the jury which is urged to accept them as the truth. Some of these doctors have an excellent professional background and hold high positions in medical schools and associations. Their court activities are generally unknown by the profession or the public, but are well recognized by all unscrupulous claims attorneys and by the big corporations who are called upon to defend innumerable claims for huge damages in cases that should have been settled on a just basis months before.

One such physician made the statement that when an attorney sends him a client with a personal injury damage suit he is expected to "find something wrong with the patient."

Time and again these doctors have testified under oath in court that a certain man was permanently and totally disabled. Yet the record may show that the disability has completely ceased within a few months following settlement of the case and the injured man has returned to the same work or a job similar to that in which he was engaged prior to his accident. In the past, few of our larger corporations have attempted to follow these men and have considered the case closed when the final settlement was accepted. Today, however, a large group of corporate defendants is attempting to follow these men, especially in cases where the extent of the disability was questioned and where a large settlement was effected. They have already accumulated a large amount of evidence indicating that this small group of habitual professional testifiers are either wholly incompetent to determine a man's actual disability, or are unmitigated liars and a disgrace to their profession. There is reason to believe that when sufficient evidence has been accumulated and presented to these doctors, or the medical societies, or the courts, their wings will be clipped and they will be forced to discontinue their unethical activities.

Some may say that this campaign should have been conducted by the ethical relations committee of our various medical organizations. Many of these committees would undoubtedly be willing to do this job and will do it when the evidence is submitted to them. It is obvious that only associations comprised of many companies are in a position to collect this evidence based on a large number of such cases from a variety of sources. This campaign can be endorsed by everyone who is really interested in justice to all concerned. Our patients, their employers and the ethical members of the medical and legal professions should cooperate in every way with this program.

—CHESTER C. GUY, M.D.

Books

"Top Book"

MODERN OCCUPATIONAL MEDICINE: A. J. FLEMING, C. A. D'ALONZO, Editors. Lea & Febiger, Philadelphia, 1954, pp. 414, $10.00.

Pleasing to all, this book was dedicated to Dr. G. H. Gehrmann at the time of his retirement and in this language: "This book is dedicated to Dr. G. H. Gehrmann, Medical Director, E. I. du Pont de Nemours & Company, upon his completion of 39 years of faithful and devoted service in the field of occupational medicine. The Editors, Associate Editor, and most of the Contributing Authors, all have had the benefit of his guidance and stimulating leadership. Although a contributing author to this text, Dr. Gehrmann was unaware that our modest effort was to be dedicated to him.

"A pioneer in the field of occupational medicine, and a champion of its progress, Dr. Gehrmann will always be remembered by us as a gentleman, scholar, inspiring leader, and valued friend.

"We dedicate this effort to him in commemoration of our esteem and gratitude."

At all times the stack of books on occupational health has a top book, and not necessarily the last publication. This present book rightly is the top book and it may be a long time before it is displaced by any better one. While this book wholly is the product of a staff of 20 persons identified with the Du Pont Company, and foremostly reflects the experience and thinking of the Du Pont Company, studiedly it has been so prepared as to be useful wherever industrial occupational health is a consideration and wherever it should be a consideration. Its contents are reflected by a listing of the major chapter headings: "The Evaluation of Medical Services in Industry"; "History of Industrial Medicine"; "Administration, Functions, Location, Personnel, Layout, and Equipment"; "Medical History and Physical Examinations"; "Medical Records: Their Purpose, Value, and Study"; "Preventive Medicine in Industry"; "Research, Toxicological Methods, and Plant Surveys"; "Protective Clothing for the Chemical Industry"; "The Functions of the Industrial Hygiene Laboratory"; "Immunizations in Industry";

"Temperature, Humidity, and Air Movement"; "Industrial Noise"; "Radiological Hazards"; "Fatigue"; "Medicolegal Aspects of Occupational Medicine"; "The Rehabilitation of the Alcoholic in Industry"; "The 'Occupational Back' ";"Surgical Considerations in Industry"; "In-plant Feeding in Industry"; "The Nurse in Industry"; "Sanitation, Water Supply and Pollution, Washing Facilities, Toilet Facilities, Sewage Disposal, and Atmospheric Pollution"; "The Chemist and Occupational Medicine"; "Safety in Industry"; "Practical Application of Psychiatry to Industry"; "Effective Discipline Promotes Mental Health"; "Chemical Health Hazards"; "Insecticides"; "The Carotid Sinus and Chemicals Which Affect It"; "Tetraethyl Lead"; and "The Problem of Acute Poisoning."

From the first page to the last, the emphasis of this book is on prevention. This attitude is observed in the Foreword in this language: "Preventive medicine has been, and always will be, the most desirable and successful approach to the diseases of life. While preventive, industrial medical measures have accomplished much toward improving and protecting the lives and health of our workers, much remains to be done. With the advancement of modern chemical science, many new problems will be created. The application of existing knowledge to the new methods and procedures can be useful in devising safe procedures in both old and new plants."

Bold is that physician who undertakes the presentation of any substantial portion of the early history of occupational health. So many errors have established themselves as seeming facts that the truth often lies submerged in error. This book, in its historic section, introduces some misstatement, or doubtful statements, that do not deserve repetition in future editions or other books. In that historical chapter this language appears: "In 1776, Benjamin Franklin established that the condition which he called 'West India gripes,' or 'dry gripes,' was really lead colic due to the drinking of rum prepared in stills in which the heads and worms were made of lead. The Commonwealth of Massachusetts then promptly banned the use of lead for this purpose."

The facts are that it was in 1723 that the still heads and worms episode occurred and the action taken was not by the Commonwealth of Massachusetts which did not then exist, but by the Massachusetts Bay Colony and at a time when Benjamin Franklin was but 17 years of age, and it was not established that Benjamin Franklin was a participant in the discovery.

On the same page, the historian in paying tribute to Charles Turner Thackrah properly observes that his span of life was 1795-1833. Yet, in the next paragraph it is recorded that in 1837 Thackrah discussed knowingly an array of undesirable working conditions. That, if true, would be writing from the grave. That book was written in 1822.

In acknowledging a cathedral of eminence within the Industrial Medical Association, as tokened by the Knudsen Award, the recital of recipients fails to include Drs. Legge, Burnell, and Hamilton.

The publishers, in proudly presenting this book, make use of this language: "This complete work presents highly dependable information that is useful to every doctor in or about to enter industrial practice. It is of exceptional value to executives, plant managers, safety engineers, physicians in public health work, insurance doctors, lawyers, nurses, and dietitians."

The publishers are right. This is a superb book. All occupational health acclaims this meritorious book and its distinguished contributors. Even more, the world of occupational health pays tribute to the E. I. du Pont de Nemours Company for its long standing farsightedness in creating the medical services from which this book sprang.

Environmental and Occupational Factors

AETOLOGIE UND PROPHYLAXE DES LUNGENKREBSES F. LICKINT: Beiträge zur Krebsforschung. Vol. 2. Dresden, Theodor Steinkopff, 1953, p. 212.

This monograph on lung cancer presents the various aspects of this problem under three main headings: increase in the frequency of lung cancer, its etiology, and its prophylaxis. The first part consists of nine chapters in which the epidemiologic pattern of the increase in lung cancer frequency, its occurrence in different countries, its sex distribution, the influence of increased aging of the population on lung cancer frequency, the effect of improved diagnostic methods in this respect, the suspected actual number of lung cancers, special aspects of pulmonary tumors (adenomas, sarcomas, reasons for preference of males, histologic types and role of congenital anomalies) are discussed. In the second part the role of various potential and actual causal factors is reviewed—infectious agents, influenza, tuberculosis, syphilis, miscellaneous chronic inflammatory processes, rare parasites, chemical substances (soot, automobile exhaust fumes, generator gases, illuminating gas, mineral oils, petroleum derivatives, coal tar and asphalt, coffee roasting products, rubber, various irritative gases, vapors and fumes, war gases, non-specific dust, silicosis, asbestosis, berylliosis, siderosis, anthracosis, tabacosis, chromatosis, nickel, arsenic, cobalt, lead, mercury, urethan, quinones, formalin, acrolein, isopropyl oil, miscellaneous chemical agents), occupational temperature changes, physical trauma, x-radiation, radioactive substances, radio waves, tobacco smoke). Since the author has been an early advocate of the cigarette theory, the epidemiologic and causal relations of tobacco smoking to cancer of the lung are discussed in great detail. The conclusion is reached that this habit represents an important factor in the production of lung cancer and its recent increase in frequency. As possible contributory or direct causal factors related to tobacco smoking, special mention is made of nicotin, cigarette paper, cigarette lighters using benzene, low grade or adulterated tobacco, arsenical insecticides, perfumes, tobacco soot, tobacco tar, carcinogenic hydrocarbons, and glycerin. The last part is devoted to brief discussions of the possible prophylactic and preventive measures which may be taken in connection with exposures to the various causal agents listed. An extensive bibliography is attached. It contains very few references from Russian sources. To the American reader it may be interesting to hear that according to official Russian statements there do not exist any industrial lung cancer hazards in Russia nor has there been observed during recent years any appreciable increase in the number of lung cancers. Lickint, however, points out that there was apparently an early and marked rise in lung cancer in Russia in former years attributable to the wide-spread habit of cigarette smoking. While one may disagree with some of the conclusions reached, the monograph provides valuable data on the lung cancer problem, and should be of distinct interest to industrial physicians.

—W. C. HUEPER, M.D.

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This Amazing Industrial Culture

NO ASTUTENESS is required to realize that those who now live in the United States are in the midst of an unprecedented industrial culture. What is difficult—and difficult even for the nimblest of minds—is fully to grasp all the ramifications of changed life beneficently imposed by readily available industrial products.

The American Petroleum Institute, in a series of advertisements, admittedly in its own interests but illuminating withal, seeks to reveal the fullness of the impact. One of the series is devoted to the altered life of the American farmer. Little thinking persons might be willing to believe that the farmer has been left scarcely touched by the surge of industrial pursuits. Just the opposite is true. In 1854 five man hours were required to produce a bushel of corn. Today that bushel of corn requires only four minutes of the farmer's work time in a favorable season. The products of the average farmer today feed 15 persons while so recently as 1920 his labors fed only nine. In Indiana, an outstanding agricultural state, a million acres have been added to the land devoted to soy-bean crops. Why this shifting? The combine, that marvelous mechanism, has made soy-bean raising more profitable. Possibly of more significance is the fact that earlier, tens of thousands of those acres were required for food for the half million horses now never born on those Indiana farms and no longer needed. That change has made possible the feeding of half a million more cattle. Foremostly horses were but laborers, but cattle are a product.

All considered, the output efficiency of the farmer has increased 45% since 1940. Contributing to this gain are the farmer's 4,400,000 tractors, 940,000 combines, 2,500,000 farm trucks, and 4,500,000 automobiles. All those machines are the products of industry—symbols of the exploding industrial culture. If by 1975, as predicted, the American farmers will be called upon to feed 200 million Americans to say nothing of overseas mouths, those farmers are nearly ready —readied by industry, the farmers' partner.

Take the farmers' bettered lot as just one degree of the 360° on the circle. Then the full unfolding of our industrial culture begins to emerge. No life is left untouched. Every industrial physician and every other physician is finding, or will find, his own life and affairs geared to this industrial culture in which outstandingly he, like the farmer, will be a beneficiary.

Exit the Human Machine

DURING the early stirring decades of occupational health, meaning this century's years up to about 1930, one of the eye-catching terms was the "human machine." At least one book bore the title "The Human Machine and Industrial Efficiency," and was written by Dr. Frederic S. Lee in 1919. In its introduction the concept of the human body as a machine concisely is stated, and now is quoted: "It is pertinent to our present purpose to regard this human element, the combined body and mind of the worker, as itself a machine. There is nothing derogatory to the worker in this conception; it is the customary conception of physiological science, which has learned to respect living substance above all other created things and yet finds it most helpful to regard every living body as a mechanism working according to the fundamental laws of all mechanisms, but with its own specific ways of act-

ing that characterize living in contrast to nonliving substance. No other factory mechanism approaches this human machine in its intricacy, the perfection of the correlation of its working parts, its combination of delicacy and strength, and its adaptability to the work required of it."

Beyond debate, the human body is a machine. A superb one. Nearly everything the mechanical and electrical engineer has thrust into his amazing and intricate machine devices, for ages faithfully has served humankind—joints, valves, digestors, separators and synthesizers. As with other machines, wear and tear take their human toll; neglect exacts reprisals; rebuilding becomes a necessity; in time the span of services is spent.

The early and long focus in industrial medical programs accentuated the machine functions of the industrial worker. The physician thought in terms of "efficiency," "energy," "fatigue," "repair," the total conservation of the machine. That was not blameworthy. That focus still is an essential in any sound program, but it is monofocal. Maturity in occupational health calls for bifocals, or, better yet, multifocals.

THE industrial worker is not all machine. No machine of steel has ambitions, but the worker has. No machine of steel suffers from anxiety, but the worker may dwell in a private world of worry, discontent, and turmoil. No machine of steel has a family of little machines. No machine of steel standing in a row has the least concern about other machines nearby, but the worker has endless needs in relation to the other human machines close at hand. Never ignoring the human machines, the industrial physician may well focus his eyes upon workers wholly apart from any semblance to machines. Therein lie the germs of alerted medical programs—programs for the invisible worker.

To a disturbing degree modern industry has stripped from the worker his sense of "belonging," of "sharing," of fitting into the beginnings and the ends. Apart from his own little work section, the worker has become a forlorn stranger in his own factory. He "wants in." He yearns to think openly of "our factory," "our plans," even "our difficulties" which "we will surmount." Having a clock number is a mighty poor substitute for the pride and joy of the now almost forgotten creative craftsmanship.

Norbert Roberts, in his recent Industrial Hygiene Foundation address, in his own way recognized these same deficiencies: "Consider the breath-taking effect that it would have on most companies if their 'average' employee felt about the company for which he works exactly the way its top management feels, if he shared management's interest in the company's interests, management's pride in the company's work, management's concern and enthusiasm for the company's welfare, and management's attitude towards the company's goals."

Blind and groping is that industrial physician who argues that all this has nothing to do with medicine or health, that the creation of attitudes in the work group is a function of others far removed from the plant Medical Department. Part of that may be true. In some measure artificial and possibly only temporary, attitudes sometimes may be made to order. The greatly to be desired attitudes between workers and management must leap from the heart. Toward this the industrial physician may contribute toweringly. The beginning may come when the industrial physician ceases to be just a machinist.

Do-It-Yourself Damage

NOT SINCE the heyday of "You Can't Take It With You" has anything spurred hobby activity like the current "do-it-yourself" flurry. Well it may be that these home activities but represent commercial exploitation of deep resentment over exorbitant charges by craftsmen who perform trivial services and who rarely are available when the emergency arises. The painter flatly refuses to mix the exact shade wanted in the bedroom, and the electrician is off on his own Christmas holiday when the guests are in the parlor, the turkey in the oven, and miserably the electric stove goes haywire. Whatever the motivation, a toll is being exacted.

The clever safety engineers to a nicety may disclose the diurnal peak of home accidents, modified as to age, sex, season, and weather. Their neat curves are being made to wobble and bulge. Physicians and hospitals everywhere are recording the "3:00 to 11:00 P.M." peaks and a further upward thrust in the Saturday and Sunday home accidents. All this is the bloody by-product of "do-it-yourself"—what with band saws running in the basement, improvised scaffolding in the hallway, and solder pots in the bathroom. Power tools and claw hammers refuse to join in the festivity of do-it-yourself. In truth, the amateur is the preferred prey of all tools. And so—the mashed thumb, the severed tendon, the electricity burn.

This may not be industrial, but it is occupational—recreational or emergency occupation. Still the pain is just the same as though the injury came from an on-the-job affront by a turret lathe—but no compensation. . . .

The pain that inspired this comment was from a "do-it-yourself" assault upon a garbage disposal that refused to "dispose." Pain, being the great motivator to action, provides the stern belief that the time is at hand for a new specialty—the "do-it-yourself" safety engineer.

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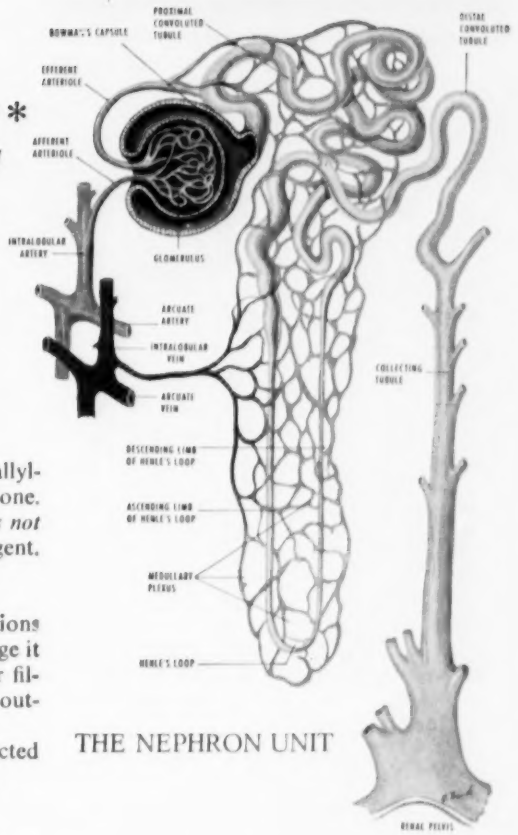

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News, Comment, Opinion

THE SAFETY programs in the larger plants are excellent and should be enlarged upon. However, a safety engineer who is overenthusiastic about getting a "no-lost-time accident" award, may be the most dangerous object in the plant.

—JAMES T. MCQUITTY, M.D., Tulane University School of Medicine.

Executive Health

WHY a health maintenance program for executives? Executives, particularly those of department stores, are usually men and women on a fairly high standard of living; they have the means to pay for excellent medical advice. Why do they need a health program at the store? Say industrial doctors: Executives neglect themselves. As a class, they do more worrying and take less action about health than rank-and-file employees. Discreet pressure from the store is needed to get the typical executive to look into his health problems, or to make sure he is as healthy as he seems to be. Say retailers who have such programs: By the time an employee reaches executive status, he represents a considerable investment of the store's money and effort. During his most productive years, it is worth management's while to make sure that no actual or imagined health problem is interfering with his ability to do his important job well.

—From *Stores* (Official Publication National Retail Dry Goods Association) September, 1954.

Didn't Know It

NEARLY half of some 500 business executives who came to the University Hospital for company paid check-ups were sick and didn't know it. A report, prepared by the University of Michigan's Medical School and Institute of Industrial Health, said 41 of a group of 500 "possessed abnormalities" which they didn't know they had. The report added that these required medical treatment. Twenty-five percent of the group had abnormalities not requiring immediate medical attention.

—*Chicago Tribune*, December 21, 1954.

"Pick Me Up, Pop!"

DR. RICHARD ASHER, of Central Middlesex Hospital in England, is sick of people who are overconscious of their health. "We must not be so busy preventing disease that we have no time to enjoy freedom from it," he warns in the *British Medical Journal*. Dr. Asher claims he "read once in an American health pamphlet that every father returning from his day's work should remove his coat and wash his hands in disinfectant before touching any of his children." If we go on that way, the doctor observes, we may finally reach the point where household conversation will run something like this—Child: "Oh, father, lift me up; there's a band marching past the window." Father: "Certainly, my boy, just wait while I gargle and put on my mask and rubber gloves."

—From "The Medicine Chest," by JOHN TROAN, in *Pittsburgh Press*, November 7, 1954.

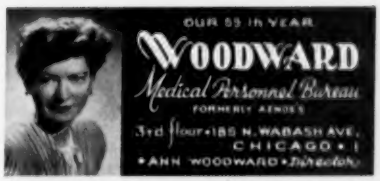
What He Learns

THE real effectiveness of the periodic health inventory is based on *what the employee learns* as a result of the examination. Medical counseling and unhurried discussions should always follow. This is the time and place for the physician in industry to impress the examinee with the significance of each of the physical findings and precisely what he should do about them. Through such a positive approach the employee comes to understand his capacities and limitations and the basic fundamentals necessary if he is to live within his own scope of health. Gradually, then, health will be accepted by him as a personal responsibility. It becomes relatively easy for him to make his own decisions in regard to drastic changes in types of work, living circumstances, etc. Health earned in this manner increases his value not only as a worker but also as a total person who, in turn, will become a good citizen of his community.

—From "Philosophy of Industrial Health Programs," by KIEFFER DAVIS, M.D., at the Seventh Industrial Health Conference, Houston, September 23-25, 1954.

Size for Safety

OFTEN the smaller industries feel that they are too small to have a health and safety program. Size from the point of view of health and safety is, as far as I am concerned, incidental. We have all seen one-man operations in which



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SITUATIONS WANTED

Medical Director: (261) Well regarded in industrial field; degrees from leading schools; long experience as Director, large industrial hygiene and research program; eminently qualified in toxicological problems; early 40's; strongly recommended.

Medical Director: (262) Outstanding man, both administratively and clinically; five years, Medical Director, large company with over 20 plants; complete charge, all policies; recommended without reservation.

Medical Director: (263) Diplomate, American Board, Internal Medicine; FACP; qualified in every phase of industrial medicine; past six years, Medical Director, major company employing 40,000 men. Top level doctor, nationally recognized in industry; early 40's.

Industrial Hygienist: (264) M.D.; excellent experience, industrial division, governmental program, past three years; early 30's. Prefers New England or East.

Industrial Physician: (265) Interested, industrial medicine as career; eminently qualified as assistant to busy Medical Director; age, 30; Class "A" graduate; year's fellowship, industrial medicine; one year; Director, AEC program; interested isotopes, nuclear-energy medicine; Category IV.

Staff Physician: (266) Class "A" graduate; five years, successful private general practice; three years, staff physician, large university; prefers industrial medicine; experienced doctor, well-qualified as an assistant to industrial Medical Director; middle 40's.

Staff Physician: (267) Class "A" graduate; early 40's; four years, surgeon; USAF; fellowship, pathology, three years; two years, assistant Medical Director, insurance company; seeks assistantship to Medical Director.

Staff Physician: (268) Class "A" graduate; ten years, successful private general practice; five years, mine physician; prefers industrial position with opportunity for some private practice preferably in the West. Late 30's.

Staff Physician: (269) Class "A" graduate; early 30's; several years, successful private general practice; prefers industrial medicine on salaried basis.

SITUATIONS OPEN

Medical Director: (109) One of major companies in important industry; 26 plants located various sections of America; five foreign plants; 60,000 employees; duties, complete charge program, policies; report to top management; requires nationally known man; headquarters, New York City.

Medical Director: (110) Chief Physician several plants located quite near New York City; excellent opportunity for rapid advancement to much higher level; about $15,-16,000; career post.

Staff Physician: (111) Foreign operations major American company; Class "A" modern 100 bed hospital; must be able to do minor surgery; two year contract; warm climate; good salary with perquisites equal to about $5,000 additionally.

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that person exercised all of the safety devices at his command. We likewise have seen one-man industries (and I am thinking particularly now of a youngster driving a hot-rod automobile); he exercises no safety precautions whatsoever. A one-man industry is big enough for a health and safety program. Some months ago, I went through the Ford plant at Dearborn, Michigan, and, instead of watching the mechanics of putting a Ford automobile together, I spent the two hours searching for the efforts of the safety engineers. There seemed to be hundreds of gadgets designed to prevent accidents, but, back of all of these many gadgets, were a group of men constantly circulating through the many employees, watching the individual workmen. Whenever anyone would do something that was considered unsafe, he was immediately called aside and given added instruction on what not to do.

—From "Sales Psychology for Health and Safety," by FRED W. FITZ, M.D., at 42nd National Safety Congress, Chicago, October 18-22, 1954.

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GENERAL MOTORS maintains 125 completely equipped Medical Departments in its plants in the United States and Canada to promote health and safety of nearly a half-million employees. These departments are staffed by more than 1,000 physicians, registered nurses, and technicians. "Our staff performs millions of physical examinations annually," said Dr. Max R. Burnell, General Motors Medical Director. "Each new employee is given a preplacement examination, and thereafter receives periodical examinations. These examinations have far-reaching effects. They provide a great opportunity for early recognition of ailments of which employees may be unaware. In such cases we, of course, refer our people to their own physicians for treatment. We feel that this is an important step in the field of preventive medicine. We cooperate with the community health officers in reporting contagious diseases. We stress in employee publications the importance of annual physical check-ups. As a result of these admonitions and their own check-ups by our medical people, many of our employees have made it a rule that members of their families be annually examined by their personal physicians. We believe that our program and the influences resulting from it play a major role in the maintenance of health on the part of many of the population in areas where we have plants. Our Medical Departments work closely with the Industrial Hygiene Department of the Research Laboratories Division of GM to make sure that no employee handles materials or substances which might be hazardous to health. Adequate ventilation is another important item. Our doctors and nurses make frequent checks of plant cafeterias to make sure that nutritious food is cleanly served." General Motors, a pioneer in the field of industrial medicine, established an in-plant training program five years ago for young doctors interested in such a career. To date, there have been 18 graduates. Although they were under no obligation to remain with General

Motors, all are now serving as Medical Directors of GM divisions or plants. This in-plant course may be one or two years. Student doctors upon enrollment are first assigned to the Medical Department in the GM Central Office where they receive guidance from Dr. Burnell. Later, they are assigned to a GM division or plant, where they receive training from the Medical Director. Currently, four young physicians are taking the course.

—*Bay City, Michigan, Times* November 22, 1954.

Noise

THE SECOND Industrial Noise Conference sponsored by the Technical Committee on Noise in Industry of Associated Industries of New York State, was held at the Chamber of Commerce Building, Rochester, New York, November 9. James H. Sterner, M.D., Medical Director, Eastman Kodak Company, served as Conference Chairman, with F. A. Patty, Head of Industrial Hygiene, General Motors Corporation, and B. L. Vosburgh, M.D., Manager, Health Services, General Electric Company, presiding. The following presentations were features of the Conference: "What is Noise?"—Dr. Allen D. Brandt, Chief, Industrial Hygiene Engineering, Bethlehem Steel Company, Bethlehem, Pennsylvania; "Measurement of Noise"—Dr. Charles R. Williams, Director, Applied Research, Liberty Mutual Insurance Company, Boston; "Fundamentals of Hearing"—C. Stewart Nash, M.D., Otologist, Rochester; "Measurement of Hearing Loss—Practical Programs for Industry"—Aram Glorig, M.D., Director of Research, American Academy of Ophthalmology and Otolaryngology, Los Angeles.

TV versus Teeth

ONE QUARTER of the illnesses in a typical American town get no treatment, according to a study published November 30 by Columbia University Press. No home-prescribed medication is given in 22% of these sicknesses. Ten percent are treated entirely by non-medical personnel. Fifty-six percent of the unskilled workers want socialized medicine; less than 4% of the business and professional people favor it. While 64% of the 500 families interviewed had a family doctor, only 47% had a family dentist. One person said, "There's this television coming before long, and I'd rather have that—and some other things—than all my teeth." Dr. Earl Lomon Koos, author of the study, states, "It was evident in many interviews that no distinction was made between the medical practitioner and the chiropractor." In "The Health of Regionville," title of the report, Dr. Koos points out the differences in attitude about sickness between members of the business and professional class and the unskilled workers. None of the professional people consult the druggist when they are sick; 17% of the unskilled workers rely solely on the druggist for medical care. About hospitals, nobody in town seems much interested. "The fact that the Regionville Hospital could not be accredited by the American College of Surgeons, and that it lacked equipment ordinarily considered essential for adequate hospital service, was not generally known, and when known appeared not to be important to the respondents." Dr. Koos is Professor of

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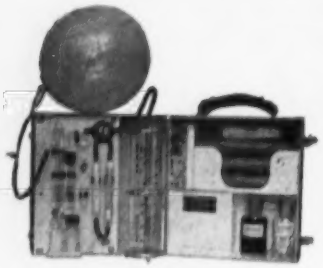

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—Columbia University Press, Release.

Public Health Meeting

THE Eighty-second Annual Meeting of the American Public Health Association and 38 related organizations drew 3,500 public health workers to Buffalo, October 11-15, 1954. Among those attending the 75 scientific meetings and viewing the 57 scientific and 93 technical exhibits were physicians, dentists, nurses, engineers, statisticians, veterinarians, sanitarians, nutritionists, health educators, entomologists, biologists and other specialists. A foreign delegation was headed by DR. MARCOLINO G. CANDAU, Director General of the World Health Organization, and MADAM RAJKUMARI AMRIT KAUR, Minister of Health for India and President of the Third World Health Assembly. Topics of special interest were smoking and lung cancer; the combating of infectious hepatitis and other epidemic diseases; newly discovered respiratory viruses, and developments in such health areas as air pollution, childhood accident prevention, and food sanitation. An innovation was a two-session Symposium, open to all delegates, which considered from many points of view the impact of suburbanization on public health. The President of the Association for 1954-55 is DR. HERMAN E. HILLEBOE, New York State Commissioner of Health, and the President-Elect, DR. IRA V. HISCOCK, Professor and Head of the Department of Preventive Medicine, Yale University. The eighty-third Annual Meeting will be held in Kansas City, Missouri, November 14-18, 1955.

The Surgeon

THE surgeon's treatment of industrial accidents does not vary in any way from the treatment and care he is expected to give the son or daughter of one of the men who may be injured. The automobile accounts for the majority of severe traumatic injuries encountered in private practice. The injury sustained by a construction worker may be, and often is, as severe as any injury in an automobile accident. Most cases originating in industrial plants will be produced by trauma; some will be occupational and not require surgical treatment, but all will require expert medical advice and treatment. The

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Medical Director: Middle West. Small plant. Can also have own private practice. Excellent opportunity with well-established national organization. (IM-3164)

Staff Physician: Well-known manufacturing company which maintains an outstanding medical program for approximately 9000 employees. Plant is ideally located in an area where climate is dry and comparatively mild. Excellent educational, recreational and shopping facilities. Good opportunity for advancement both financially and in responsibility as company maintains plants in all parts of country; to $11,700. (IM-2264)

Industrial Hygienist: Young, Masters degree. Large insurance company wants to train as Safety Engineer. Excellent opportunity to establish yourself with an old-line company. (IM-7124)

POSITIONS WANTED

Medical Director: (KS-654) Age 45. M.D. degree, Northwestern University Medical School; Fellowship in surgery, Northwestern University; Associate in surgery, Cook County Hospital. Ten years administrative experience in the field of industrial medicine. Has organized and directed comprehensive medical programs.

Medical Director: (CM-654) Age 48. M.D. degree, Jefferson Medical College; Master of Public Health, Columbia University. Has specialized in Industrial Health Administration; eligible for American Board of Preventive Medicine. Twenty years experience.

Staff Physician: (BM-654) Age 28. M.D. degree, Louisiana State University Medical School. One year general practice residency. Excellent references. Class IV. Prefers South or Southeast.

Industrial Surgeon: (HPM-654) Age 45. M.D. degree, University of Michigan Medical School. Certified in surgery, 1946.

Staff Physician: (EH-654) Age 32. Has passed Part I American Board of Physical Medicine and Rehabilitation; M.S. in Occupational Medicine; graduated Master of Public Health 1952. Will go anywhere.

Industrial Nurse: (MA-654) Age 37. Ten years experience in industry. Good administrative background. Available now, will go anywhere.

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basic principles that have elevated the practice of surgery, apply to industrial accidents the same as they apply to civilian accidents. Any compromise of these principles will increase the cost to the company and the permanent disability that the employee will keep with him. The surgeon must learn to accept the various pressures that arise from all interested parties when he begins the treatment of one of these cases. At times a complicated case will bring forth many suggestions from the very best of claims superintendents, employers, family and interested friends, and members of the Bar. Occasionally, they will attempt to have surgical principles altered in an effort to get a man back on his job. This multiplicity of interest is a complicating factor when compared to the handling of a private patient and his family.

—From "Surgery in Industrial Medicine," by JAMES T. MCQUITTY, M.D., Tulane School of Medicine.

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OUR HEART beats 38 million times in a year, 16,200 times in a single day, and pumps 4,320 gallons of blood daily through 60,000 miles of blood vessels. Yes, 60,000 miles! such a length has our system of arteries, veins and capillaries. The power of the heart, doing all this work, is equal to that required to lift a ton 82 feet high. The blood not only nourishes but also defends us in case of disease, with the 40 billion white blood cells (leucocytes) which are manufactured by the bone marrow. If disease is prevalent, there may be even an additional 100 to 200 billion leucocytes produced within a few days, to kill germs and bacteria in the blood stream. With each breath we breathe a pint of air into the lungs. The respiratory surface of our two lungs is about 700 square feet, and we have 1,800 square feet of blood vessels in the lungs and 300 million airsacs. A human being eats more than 20 cubic feet of oxygen in 24 hours, and the blood gives up more than 20 cubic feet of carbon dioxide. How much blood goes through our lungs? As much as through our blood vessels: 4,320 gallons. Our body is composed of 26,500,000,000,000 cells which are in continuous motion. These cells present a length of 400,000 miles into space. We own 22 feet of intestines to do the digestive work, and have 639 muscles. One square inch of those 639 muscles can lift up to 140 pounds. The ligaments, which connect body organs and bones, are very strong—they may often support weights of 1,000 pounds.

—From "Survey Made by the Medical Research Division, The Lorenz Foundation," October, 1954.

As Others See Us

SOME Personal Observations on Industrial Health in the United States of America," BRYAN HARVEY, *British Journal of Industrial Medicine*, 11: 3, 222 (July) 1954. Mr. Bryan Harvey, one of H. M. Inspectors of Factories in the British Factory Department, was awarded a Rockefeller Foundation Fellowship for graduate studies in the Harvard School of Public Health in order to study industrial health in this country. In his article on "Some Personal Observations on Industrial Health in the United States of America"

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he sets forth the impressions gained in the course of his American visit. He discusses the underlying philosophy of the American system of industrial health, as he sees it, and points out both its defects and its virtues. Although his outlook may at times be conditioned by the opinions and prejudices from which it is not possible to divorce oneself entirely, his observations are penetrating and thought-provoking. He points out that while compensation insurance, the backbone of the American system, has done so much to stimulate the control of known occupational hazards, it may not to the same extent encourage either the medical profession or the industrial hygienists to discover new industrial diseases and hazards. He contends that American industry, in insisting on scientific proof of toxic dangers and their presence in the atmosphere, seems to delay to some extent the application of measures of control. This attitude has led to the development of more and more accurate and involved means of air analysis in an effort to be more convincing to management. Air sampling and analysis techniques involve considerable theoretical training in America, he found, and are much more widespread than in England. Particularly noticeable, both in the academic field and elsewhere, Mr. Harvey says, is the fact that, among the lines of defense proposed against industrial poisons, substitution is the last, whereas in England it is the first. This, he feels, is at variance with American views on industrial safety. The most marked impression taken home by Mr. Harvey was the lack of coordination of the efforts of the various persons interested in the subject of industrial health and, as a result, the lack of statistics of industrial disease for the nation as a whole. In England, the Factory Department acts as an industrial enforcement service to establish the minimum standards without reference to geographical barriers. Mr. Harvey, however, does not discount the tremendous work which is being done in this country to improve industrial conditions, and he is high in his praise of the startling progress made in so few years. Industrial hygiene, he states, is pre-eminently the American contribution to industrial health. Progress is most obvious in the field of atmospheric control, where American skill and ingenuity have been employed to solve ventilation problems involving toxic hazards and comfort of workers. Industrial medicine in the United States the author sees as clinical medicine applied to the factory as a group rather than to the individual as in private practice. He noted the remarkable reduction in lost time from accidents where a Medical Department has been set up and credits this to improved treatment of injury and to rehabilitation, but feels that the industrial Medical Departments could give a more prominent place in their outlook or activity to problems of indus-

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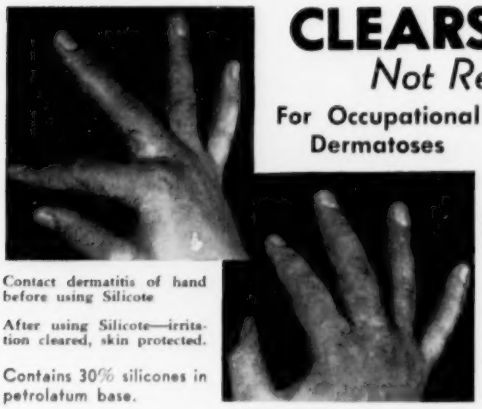

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1. Talbot, J.R. et al: J. Inv. Derm. 17:125
2. Morrow, Grant: Calif. Med. 80:21

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trial toxicology instead of leaving this phase largely to the industrial hygienist. He was particularly interested in the trend towards preventive medicine.

—From *Industrial Hygiene Digest*, September, 1954.

Conclusions Questioned

THE significance of earlier findings regarding the relationship of cigarette smoking and lung cancer is questioned by Prof. Sidrey Russ, physicist and radiologist, in the *British Medical Journal*. He asks, "If cigarette smoking is responsible for the majority of deaths from lung cancer, how is it that people in the United States, who smoke 30% more cigarettes than we do, show a death rate for lung cancer less than half of ours?" Prof. Russ's comments deal with the results of an investigation by Dr. Richard Doll and Prof. A. Bradford Hill, whose report appeared in the *British Medical Journal*, December 13, 1952. He argues that their results do not support the conclusion that cigarette smoking causes cancer. A strictly impartial comment, he suggests, would be that "there is a higher percentage of heavy smokers among the cancer men than among the controls. Cause and effect are not always easily distinguishable. If an inquiry showed that men with cancer of the stomach took more alcohol than their controls it would be quite rational to look upon a little excess of alcohol as the effect and not the cause of the disease: it might be like this with smoking." Quoting statistics from the Doll and Hill report, he says, "If as an example we select the 10-cigarette-per-day man, for every lung cancer man there are about 200 similar smokers without cancer. Are we to conclude that if the one man in several hundreds who gets lung cancer smokes 10 cigarettes a day as do the others, then smoking has caused the lung cancer? It is possibly true, but is not the long arm of causation being unduly stretched in maintaining the same position for all and every grade of cigarette-smoking?" He then refers to the 40-cigarette-a-day man: "To get a proper perspective, it must be remembered that the control non-cancer man is one out of about 100 who could serve as controls . . . it is one very heavy smoker who gets lung cancer as against 100 similar smokers who do not." Declaring that there is no simple relationship between the death rate from lung cancer and the degree of cigarette smoking, he says, "The people of the United States are the largest per person cigarette-smoking people in the world, yet their lung-cancer death rate is about the same as that of the people of Switzerland and Denmark. They smoke about one-half of the quota of Americans. It is to be accepted as a fact that people in England and Wales with lung cancer do on the whole smoke more cigarettes than control people of the same age group. But the fact that as we go from one country to another, no relationship exists between cancer death rates and the degree of cigarette-smoking seems to point to something quite significant: surely there must be some other factor at work."

—Foreign Letters, *J.A.M.A.*, December 11, 1954.

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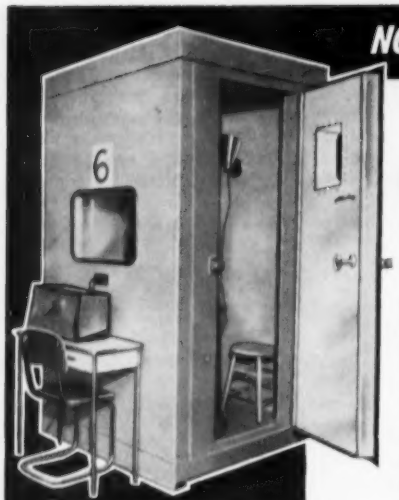

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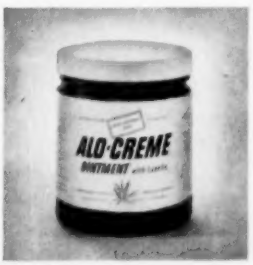

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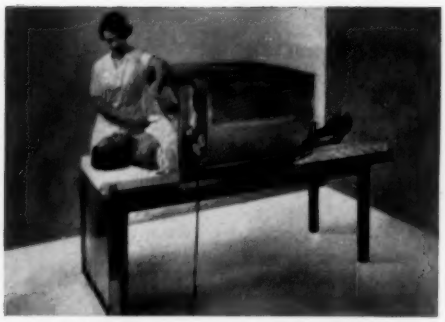

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1. Vainder, M. Indus. Med. & Surg., 22:183, 1953

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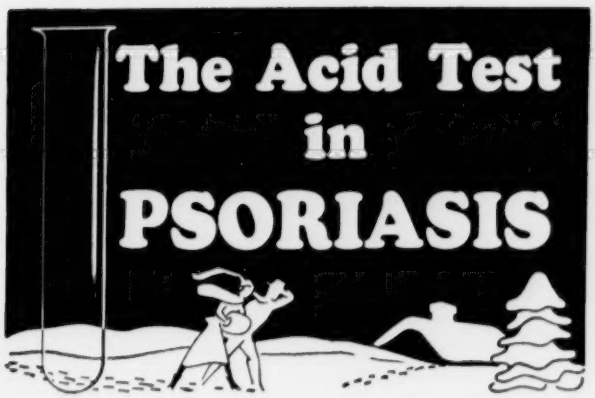

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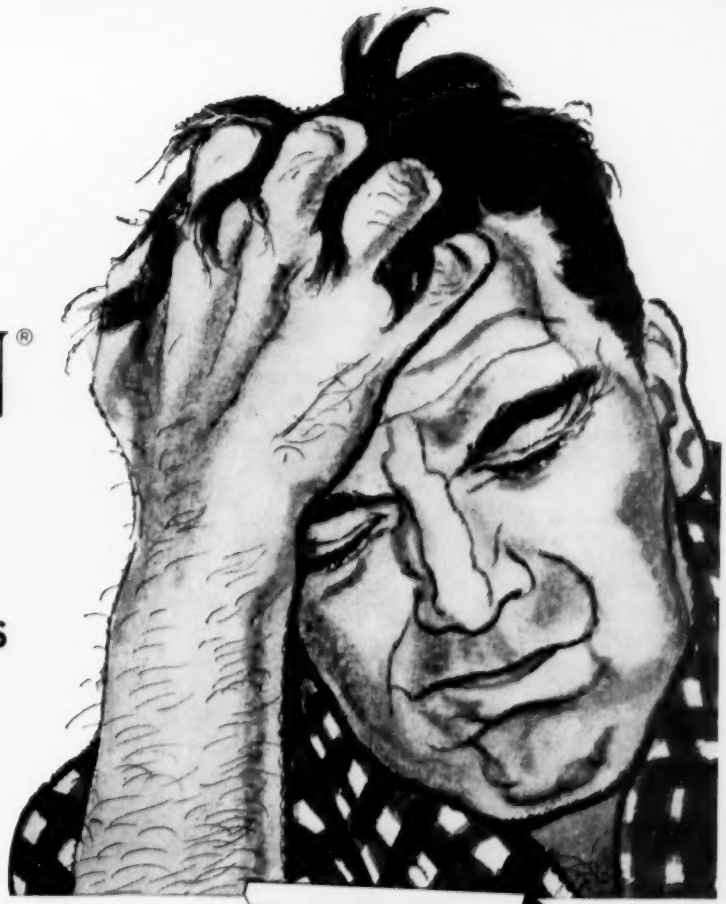

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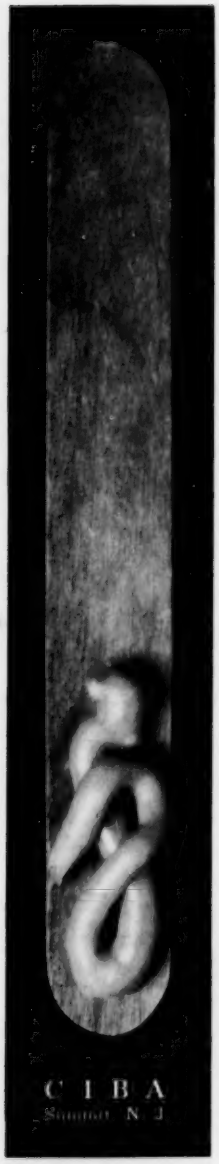

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